May 23, 1950 E. C. POLLARD 2,508,537

WAGON HOIST

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Fig. 1

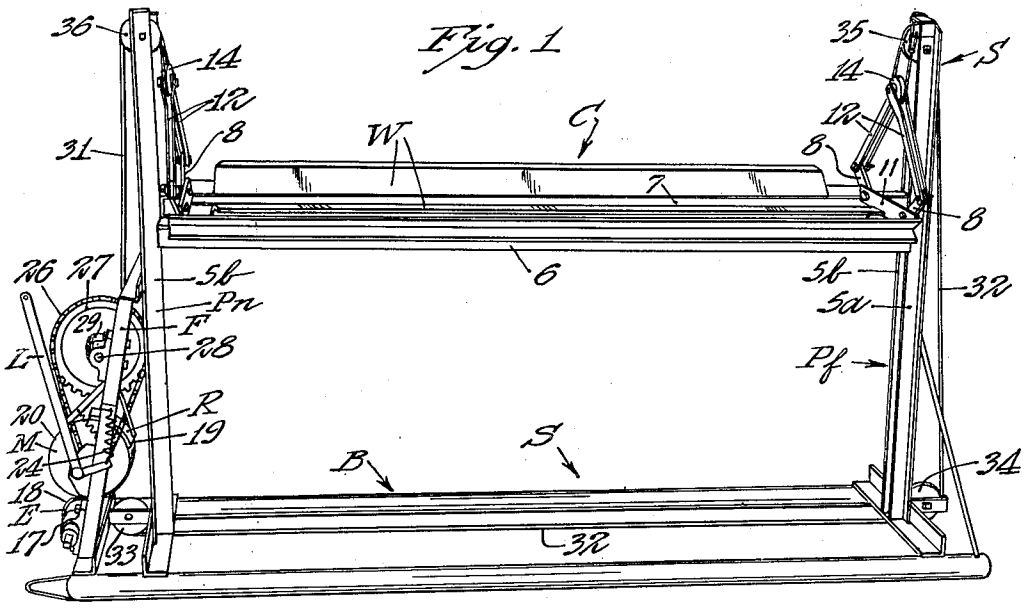
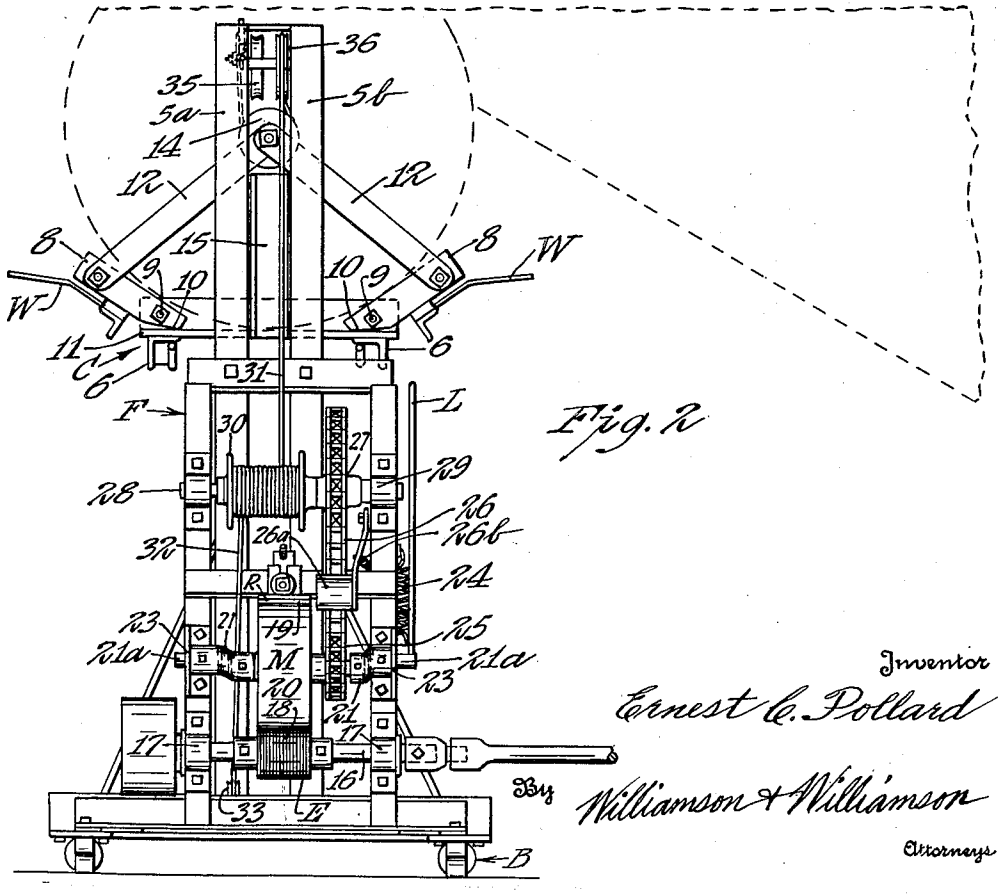


Fig. 2



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Fig. 5

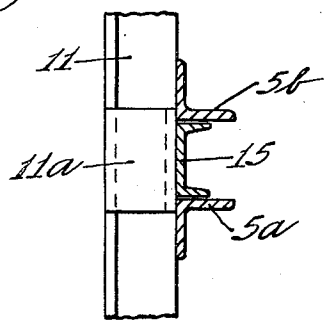
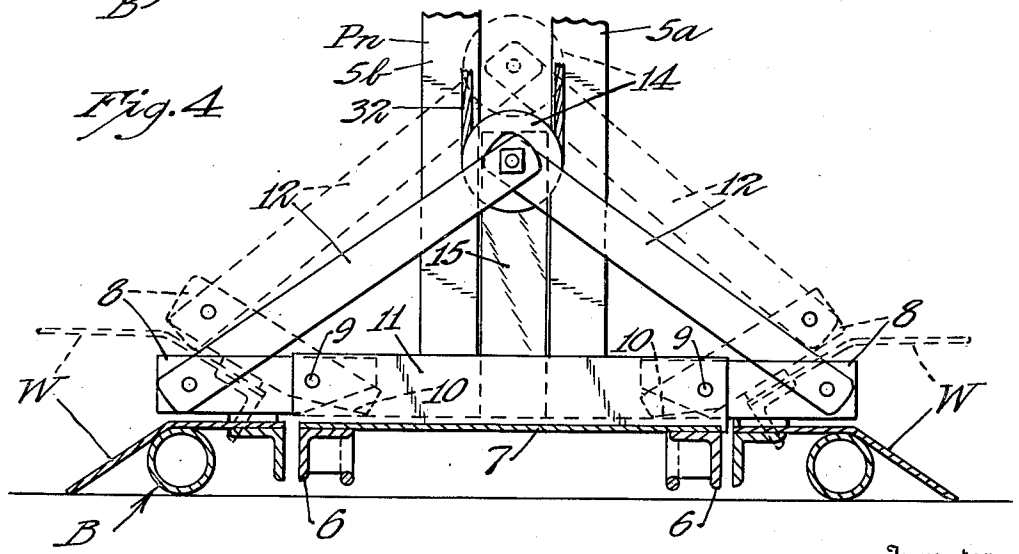


Fig. 3

Fig. 4



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Patented May 23, 1950

2,508,537

UNITED STATES PATENT OFFICE

2,508,537

WAGON HOIST

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Application December 9, 1946, Serial No. 715,024

2 Claims. (Cl. 214—46.5)

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This invention relates to a hoisting and tilting device to be used primarily in the unloading of vehicles.

Formerly such tilting devices were of a non-portable type generally actuated by a hydraulic cylinder in combination with a weighing scale platform or a permanent unloading platform. Such tilting devices could not readily be moved from one location to another.

If such devices were portable, they had heavy overhead superstructures which made them top-heavy and cumbersome for moving and could not readily be moved over the ground.

It is an object of the present invention to provide a novel and improved hoisting and tilting device of relatively simple construction which can be used as a hoist and is primarily designed to tilt load-carrying vehicles which are not adapted with a dumping mechanism, thus facilitating easier unloading of such vehicles.

It is a further object of the present invention to provide a novel and improved hoisting and tilting device of relatively simple and compact construction having a low center of gravity adapted to be movable from one locality to another over reasonably rough ground without difficulty.

It is a further object of the present invention to provide a novel and improved safety device for retaining the front wheels of the vehicle to be unloaded, which safety device also forms a ramp when in lowered position making the carriage easily accessible.

A further object is to provide a novel and improved hoisting and tilting device having an easily operated single control for elevating, lowering, or retaining in elevated position the carriage, thus reducing the danger of fracture of the parts by instantaneous reaction to this control.

Another object is to provide a novel and improved hoisting and tilting device having in combination with a vertically movable carriage mounted in a supporting frame, a rotary driving element, a retaining element in spaced relation thereto, and a shiftable driven element selectively engageable with either said driving element or said retaining element.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to similar parts throughout the several views and in which:

Fig. 1 is a perspective view showing the entire structure with a movable carriage in raised position.

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Fig. 2 is an end elevation view showing carriage elevating and retaining mechanism, its mounting on the support frame, and also showing in dotted lines the front wheels and parts of the tilted vehicle with carriage in raised position.

Fig. 3 is a vertical central sectional view of the operating end, showing the operating mechanism in greater detail.

Fig. 4 is a transverse vertical sectional view looking toward the right as viewed in Fig. 1; and

Fig. 5 is a section view through the line 5—5 in Fig. 3 showing in detail the end mounting of the carriage in the vertical support members.

My improved hoisting and tilting device includes a pedestal type supporting frame designated in its entirety by the letter S, shown in Fig. 1, a carriage C having its end portions mounted for vertical movement in said supporting frame S, said carriage being adapted to receive and elevate the front wheels of a vehicle for tilting said vehicle, a rotary driving member E mounted on said supporting frame S, a retaining member R mounted on said support S in spaced relation to said rotary driving member E, and a shiftable rotary driven member M interposed between said driving member E and said retaining member R, and means for flexibly connecting said driven member M with said carriage C.

The frame assembly S comprises a base B shown in Fig. 1 adapted to be moved over the ground in a sled-like manner, two vertical support posts P*n* and P*f* attached to said base B and comprising spaced vertical guide members 5*a* and 5*b*, which in the form shown are merely two steel angles. There is also a machinery support frame F attached to support post P*n* and to the base adjacent to the post P*n* and on the opposite side thereof from the carriage. Attached near the center to the base B are sheaves 33 and 34 as shown in Fig. 1. Also as shown in Fig. 1 sheaves 35 and 36 are attached at the top of P*f* and P*n* respectively.

The carriage C comprises a rectangular carriage frame 6 having a carriage platform or plate 7 mounted thereon and having longitudinal wheel retaining wing members W attached for oscillation on rocker arms 8, best shown by Fig. 4. A pair of rocker arms 8 are mounted transversely on each end of the carriage C adapted to oscillate about pivot pins 9, beveled edges 10 of rocker arms 8 abutting against the top flat surface of the transverse carriage frame members 11 thus limiting rotation about pins 9.

Pivotally connected to the free ends of rocker

arms 8 are the lower ends of toggle arms 12 having their free ends pivotally connected to sheaves 14.

As shown in Fig. 5 on each end of the carriage 6 mounted midway on transverse members 11 are support angles 11*a* for attaching short vertical channel members 15 which are adapted to slide between the vertical guide members 5*a* and 5*b* of each of the supporting posts P*n* and P*f*.

The rotary driving member E as shown comprises a rotary shaft 16 mounted transversely for rotation in bearings 17 on supporting frame F near the base B as shown in Fig. 2, said shaft being connectible with an external independent power source at either end. Shaft 16 as shown has a medially disposed friction driving wheel 18 fixed thereto. The retaining element R, as shown in Fig. 3, is mounted on supporting frame F in spaced relation to said driving wheel 18 and as shown comprises a brake shoe 19.

Interposed between said driving wheel 18 and said brake shoe 19, for selectively engaging either driving wheel 18 or brake shoe 19, there is a driven wheel 20 journaled for rotation on crank shaft 21. The said crank shaft 21 as shown is adapted to be oscillated on its offset extremities or trunnion stub shafts 21*a*, which are mounted transversely on supporting frame F in bearings 23. A lever L is fixed to trunnion stub shaft 21*a* for oscillating said crank shaft 21 in bearings 23. Spring 24 is provided to urge wheel 20 in braking engagement with brake shoe 19, said brake shoe 19 being adapted to receive and retain said driven wheel 20. Also journaled on the crank shaft 21 and fixed to driven wheel 20 for rotation therewith is a small sprocket wheel 25, which drives an endless driving chain 26. The chain 26 as shown is trained about a larger sprocket wheel 27 and a belt tightener 26*a* is provided to maintain tension upon driving chain 26 urged against the intermediate portion of chain 26 by a coil spring 26*b*. Sprocket wheel 27 is fixed to a shaft 28, said shaft being mounted on the supporting frame F for rotation in bearings 29. Also fixed to shaft 28 for rotation with sprocket wheel 27 is a cable-winding drum 30.

When the carriage C is in lowered position, wheel retaining wing members W form short ramps facilitating access to the carriage C of the front wheels of the vehicle to be tilted and unloaded. If such vehicle is being towed, the tractor may run over the carriage C, pulling the front wheels of the loaded vehicle on to the said carriage C and then the tractor may be unhitched and the vehicle tilted and unloaded. When the front wheels of the vehicle to be unloaded are in place on the carriage platform 7, external rotary power can be employed at either end of the driving shaft 16.

When this external rotary power is applied to shaft 16 thus rotating driving wheel 18, driven wheel 20 may be shifted into driving position by manually operating lever L. Lever L controls the engagement of driven wheel 20 with either the driving wheel 18 or the brake shoe 19. The driven wheel 20 in the structure shown is the only shiftable member. Both the brake shoe 19 and the rotary driving wheel 18 have fixed relations on frame F.

When driven wheel 20 is engaged with the constantly rotating driving wheel 18, the small sprocket wheel 25 drives chain 26, which rotates the larger sprocket wheel 27 which turns winding drum 30. Thus the cables 31 and 32 are wound on drum 30 at the same rate and both ends of the carriage C are raised at equal rates. When the cables 31 and 32 are wound on drum 30, the sheaves 14 at each end of the carriage C are elevated, thus pulling up on the toggle arms 12, which in turn rotate the rocket arms 8 through a limited angle about pins 9, said rotation being limited by the abutting of beveled edges 10 of the rocker arms 8 against the top flat surface of carriage transverse frame members 11. This limited rotation of rocker arms 8 about pins 9 swings the wheel embracing wing members W into raised position before the carriage platform 7 can be elevated at all. When wing members W have been raised as far as is permitted by rocker arms 8, additional elevating force if applied will raise the carriage C and thus elevate the front portion of the vehicle which is to be tilted.

It will be noted that the structure described provides a very responsive "finger-tip control" for applying elevating power and for releasing the same and simultaneously retaining the winding drum with the carriage at a desired elevated position. In this connection control lever L is urged by the spring 24 to normally engage the driven element or wheel 20 against the brake shoe and, when manually pulled outwardly, simultaneously disengages the brake and frictionally connects the wheel 20 with the driving element 18 on the rotary shaft 16.

Attention is called to the stable portability of my device. The structure of the base and open-top frame provided by the base and its two upstanding posts and the low center of gravity of the shaft 16, which is connected to the external source of rotary power, as well as the positioning of the shiftable driven element, all combinatively produce a highly simplified, efficient device, eliminating the necessity for overhanging supports and adapted to be easily moved from place to place by travel over the ground.

From the foregoing description it will be seen that I have provided a compact, easily portable mechanism particularly adapted for tilting farm vehicles to facilitate unloading them.

It will of course be understood that various changes may be made in the form, details, arrangement, and proportions of the various parts without departing from the scope of the present invention which, generally stated, consists in the matter shown and described and set forth in the appended claims.

What I claim is:

1. A hoisting and tilting device adapted to elevate the wheels at one end of a vehicle for tilting the body of said vehicle, having in combination an upright support comprising a base and spaced vertical guides rising therefrom, a carriage having its end portions mounted in said guides for vertical movement, power driven elevating and carriage supporting mechanism mounted on said support, said carriage providing a vehicle-wheel-engaging platform having at the longitudinal edges thereof upwardly shiftable wheel retaining elements adapted when raised to retain the supported wheels of the vehicle to be tilted, said retaining elements being shaped to form short ramps leading to said platform when the carriage is in lowered position, flexible pulling elements connected with said elevating mechanism and connected with the respective ends of said carriage, and the connections of said flexible elements with the ends of said wheel retaining elements to initially shift the same upwardly into operative position when pull is ap-

plied to said flexible elements and to thereafter elevate said carriage.

2. A hoisting and tilting device having in combination an upright support having spaced vertical guides, a carriage having its end portions mounted for vertical movement in said guides and adapted to receive, retain, and raise to an elevated position the front wheels of a vehicle to be unloaded, said carriage comprising a front tire-engaging and supporting platform, a pair of swingable wheel-retaining wing members pivotally connected to said platform and disposed longitudinally thereof respectively adjacent the side portions thereof, a pair of rocker arms respectively fixed at the ends of each of said wing members, a pair of toggle arms respectively connected at their lower ends to the rocker arms at each end of said carriage and having their upper end portions pivotally interconnected, stop means for limiting the swinging movement of said wing members, a rotary driving element mounted on said support, a retaining element mounted in fixed spaced relation to said driving element, a rotary driven element interposed between said

driving element and said fixed retaining element, means for laterally shifting said driven element for selectively engaging either said driving element or said retaining element to respectively raise or hold said carriage, and means for flexibly connecting said driven element with the upper end portions of said toggle arms to controllably support said shiftable carriage whereby said wing members are initially raised to retain a vehicle wheel thereon and thereafter said carriage elevated.

ERNEST C. POLLARD.

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