July 6, 1948. C. E. ALMENDINGER ET AL 2,444,690

BURIAL VAULT TRANSPORTING AND LOWERING APPARATUS

Filed Nov. 23, 1946

3 Sheets-Sheet 1

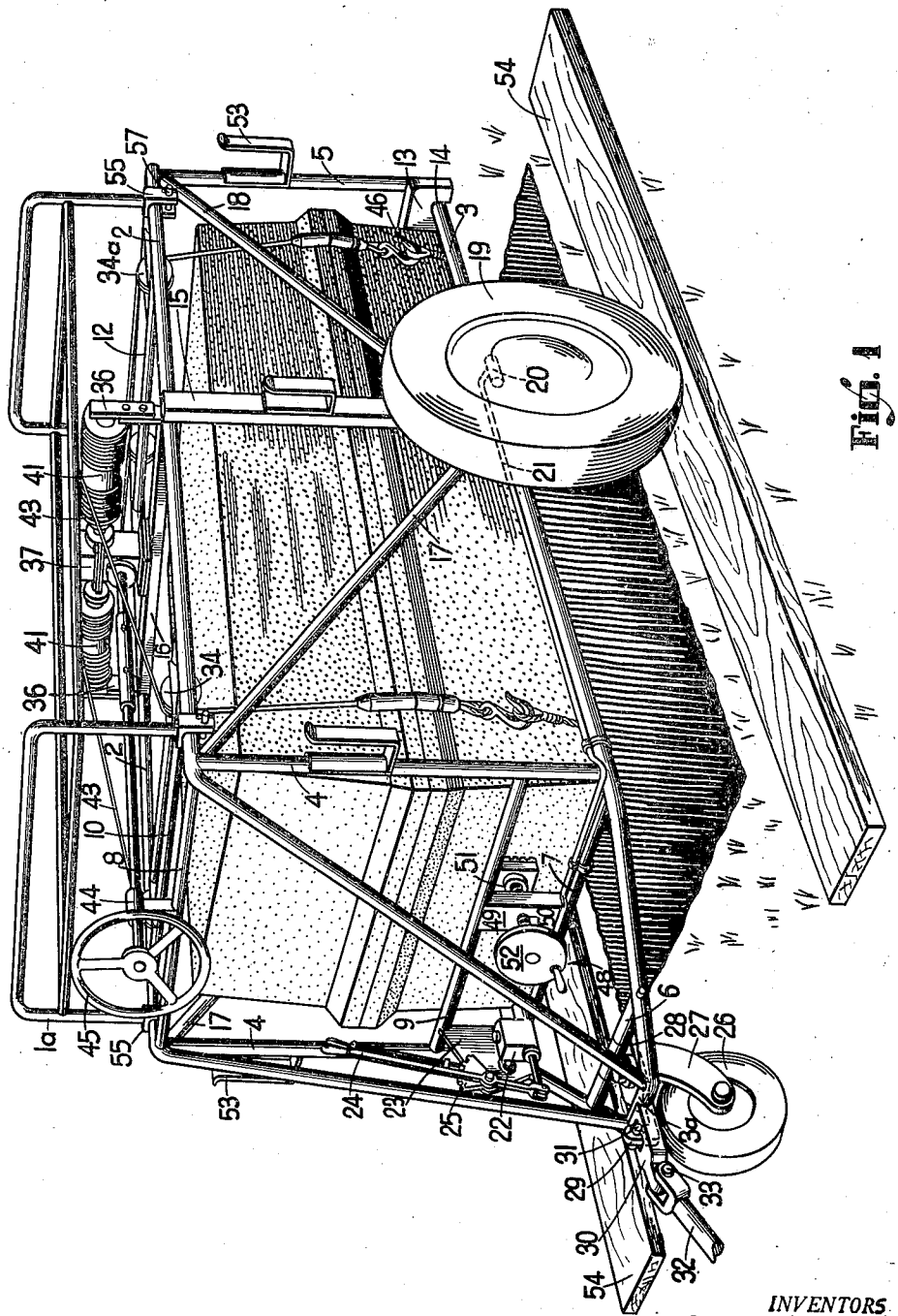

Fig. 1

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3 Sheets-Sheet 2

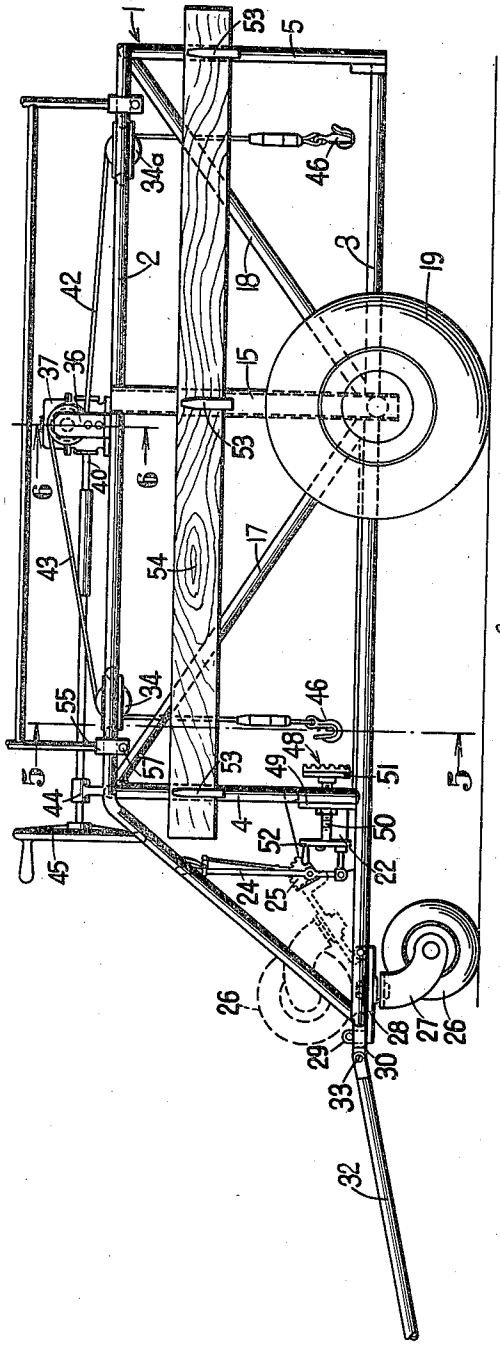

Fig. 2

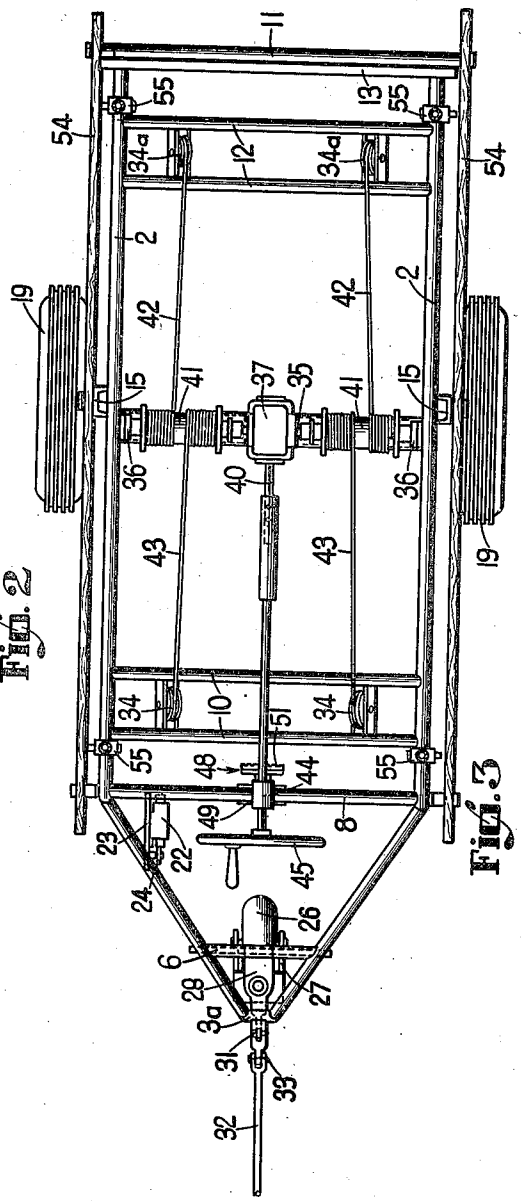

Fig. 3

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3 Sheets-Sheet 3

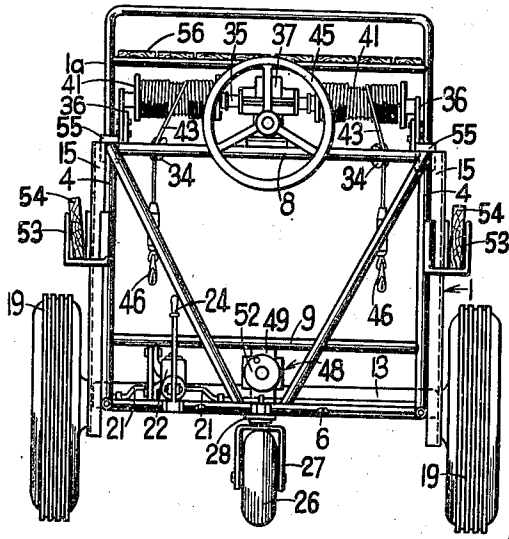

Fig. 4

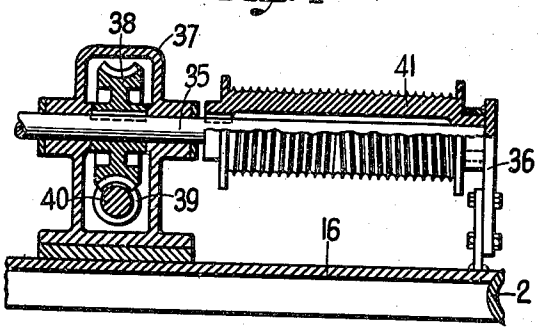

Fig. 6

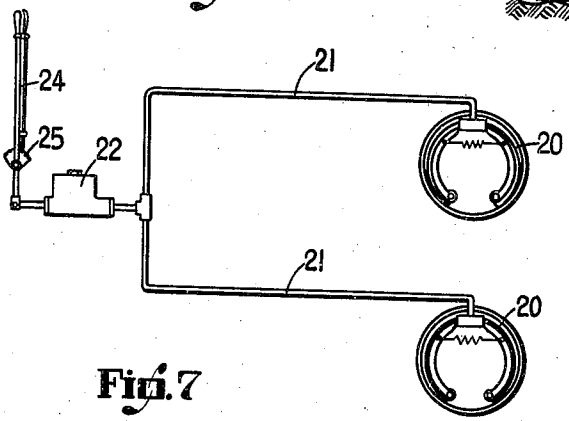

Fig. 7

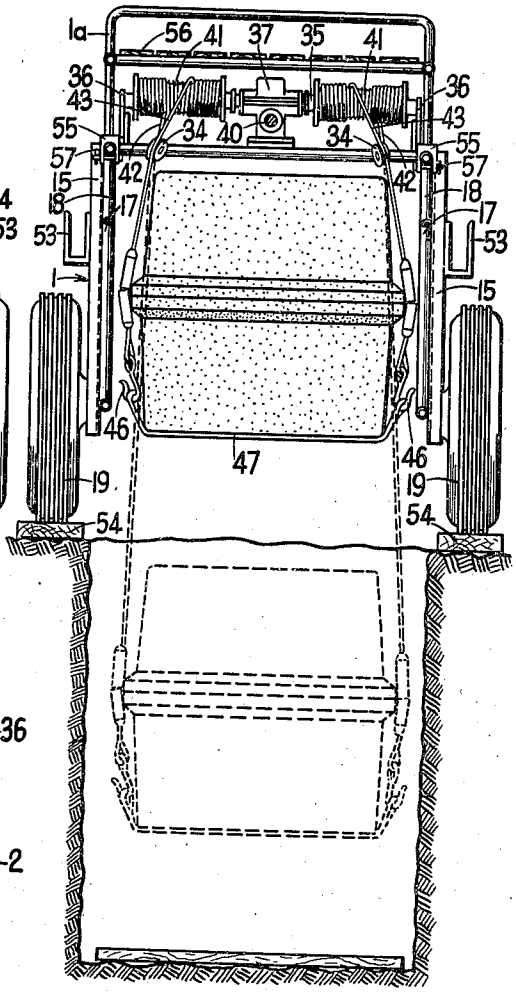

Fig. 5

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UNITED STATES PATENT OFFICE

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BURIAL VAULT TRANSPORTING AND LOWERING APPARATUS

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Application November 23, 1946, Serial No. 711,914

7 Claims. (Cl. 214—75)

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Our invention relates to burial vault transporting and lowering apparatus. It has to do, more particularly, with a vehicle designed as a trailer for supporting a vault for transportation to the grave and for lowering the vault down into position in the grave.

Many different types of burial vault-handling devices have been constructed in the past. One great disadvantage of such prior art devices has been that the same device has not been entirely suitable for transporting the vault from the manufacturer to the grave and also for lowering it into the grave. With prior art devices, the vault is usually supported by being suspended from a frame by cables but is not prevented from swinging longitudinally and laterally relative to the frame. The result is that during pulling of the vault-carrying device from the manufacturer to the grave, especially if traveling at relatively high speed, the pendulous swinging of the vault results in damage to the vault or the frame or both. Some prior art devices have been of such structure that they could not be moved from a position beyond the end of the grave over the headstone or footstone to a position directly over the grave without interference of part of the frame with the stone. In others, the cable arrangement and the mechanism for reeling the cables or paying them out has been complicated and difficult to operate to raise or lower the heavy vault and to lock in the desired condition.

One of the objects of our invention is to provide a single device of the trailer type which can be used effectively for transporting a heavy vault from the manufacturer to the grave and for lowering the vault properly into the grave or which can be used to raise the vault from the grave for disinterment.

Another object of our invention is to provide a vault-handling vehicle of the type indicated which is so constructed that the vault will be so supported and held during transportation that there will be no danger of damage to the vehicle itself or to the vault.

Still another object of our invention is to provide a vault-handling vehicle of the type indicated which is provided with a simple cable arrangement and operating mechanism which can be operated with ease to lift the heavy vault into position for transportation or to lower the vault into the grave, such mechanism including locking means which effectively locks the cable drums against rotation when the paying out or reeling in of the cables is interrupted.

Another object of our invention is to provide

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a vault-handling vehicle which is so constructed that it can be moved from a position beyond one end of the grave to a position directly over the grave without interfering with a headstone or footstone marker of the usual type.

An additional object of our invention is to provide a vault-handling vehicle having brake mechanism associated with the wheels thereof so that the vehicle will be effectively held in position over the grave without danger of moving during the vault lowering operation.

A further object of our invention is to provide a vault-handling vehicle which is so designed that all of the controls for actuating the various mechanisms on the vehicle are located at the draught or tongue-bearing end of the vehicle so that one person can maneuver the vehicle over the grave and readily operate such controls when necessary.

Other objects will be apparent.

According to our invention, we provide a vault-handling device of the trailer type which can be pulled by a truck or other vehicle from the vault manufacturer or dealer to a position adjacent the grave. The vehicle includes a frame which carries a pair of transporting wheels intermediate its forward and rearward ends and a steering wheel of the caster type at its forward end. The forward end of the frame may have a tongue attached thereto for manipulating the trailer by hand or may be provided with a trailer hitch for connecting it to a truck or tractor. The caster wheel is used only when the vehicle is adjacent the grave and is so mounted that it may be swung up into inoperative position when the trailer is to be hitched to a truck or tractor. We preferably provide hydraulic brakes associated with the rear wheels and these brakes can be controlled from the front end of the frame. The brakes will serve to hold the trailer in position over the grave during the vault lowering operation. The frame has associated with it hoisting mechanism, consisting of a cable and drum arrangement, which can be operated by means including worm and gear mechanism for raising a heavy vault into transporting position or for lowering it into the grave. A control for this hoisting mechanism is also located at the forward end of the frame. We provide means associated with the frame for securely gripping the cable-suspended vault, when in transporting position, for preventing pendulous swinging of the vault on the frame either laterally or longitudinally, during transportation. This gripping means can also be controlled from the forward end of the

frame. The frame is so constructed that it will be free of cross members at its rear end which are lower than the suspended vault so that the trailer can be backed over the grave without interfering with a headstone or footstone.

The preferred embodiment of our invention is illustrated in the accompanying drawings wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is a perspective view of our vault-handling vehicle showing it positioned over a grave preparatory to lowering the vault therein.

Figure 2 is a side elevational view of our vault-handling vehicle.

Figure 3 is a plan view of the vehicle.

Figure 4 is a front end view of the vehicle.

Figure 5 is a transverse sectional view taken along line 5—5 of Figure 2 and showing by dotted lines the lowering of the vault into the grave.

Figure 6 is a sectional view taken along line 6—6 of Figure 2 showing part of the hoisting mechanism.

Figure 7 is a diagrammatic view of the hydraulic brake system of the vehicle.

With reference to the drawings, we have illustrated a vault-handling vehicle of the trailer type which includes a frame 1. This frame is preferably fabricated mainly from steel tubular members welded together. At each side, the frame consists of an upper longitudinally extending tube 2, a lower longitudinally extending tube 3, a forward vertically disposed tube 4 connected to members 2 and 3 and a rearward vertically disposed tube 5 also connected to members 2 and 3. The two lower members of the frame 3 are bent towards each other at their forward ends and substantially converge where they are connected together by a short transverse section 3a. Spaced slightly behind the section 3a is a transversely disposed pivot pin 6 which is secured between the converging forward ends of the lower members 3. In the same plane as the forward vertical tubes 4, we provide a lower cross-member 7, disposed between and connected to the two lower members 3, and an upper cross-member 8, disposed between and connected to the upper longitudinal members 2. Directly forward of cross-member 8, the ends of both members 2 are bent downwardly and towards each other into association with the short transverse section 3a to which they are connected. Spaced slightly above the lower transverse member 7 is a parallel transverse member 9 which is disposed between and is secured to the forward vertical tubes 4. Spaced slightly behind the upper transverse member 8 is a pair of spaced transverse members 10 which are disposed between and are secured to the longitudinal tubes 2. A rear cross-member 11 is connected to the rear ends of members 2 and is disposed therebetween. Spaced slightly forwardly of this member 11 is a pair of spaced cross-members 12 disposed between and secured to tubes 2. The lower rear corner of the frame is free of permanently attached cross-members but is adapted to receive a transverse flat clamping bar 13 which is provided with a pair of notches 14 that slip over the members 3. On each side of the frame intermediate its ends, we provide a vertically disposed inwardly directed channel member 15. This channel member has its upper and lower ends welded to members 2 and 3. Disposed between the upper longitudinal members 2 and between the upper ends of channels 15 is a downwardly facing channel 16 which has its ends welded to members 2. At each side, the frame is further provided with a rearwardly and downwardly extending diagonal brace 17 and with a forwardly and downwardly extending diagonal brace 18. The upper end of brace 17 is welded to members 2 and 4 at their junction point and the upper end of the brace 18 is similarly welded to members 2 and 5. The lower ends of the braces 17 and 18 converge at a point in the same plane as channel 15 and are welded to the lower longitudinal member 3. Thus, a rigid frame is provided.

For supporting the frame for transportation, we provide the two rear wheels 19. These wheels may be of the automobile type and are mounted on axles carried by the lower ends of channels 15 which extend below the lower longitudinal members 3. Associated with each of the wheels 19 is a hydraulic brake unit 20 of the usual type illustrated diagrammatically in Figure 7. The brake units 20 are connected by suitable conduits 21 to a booster pump 22 which is supported adjacent the forward end of the frame by a bracket 23 (Figure 1) which is attached to cross-members 7 and 9 and the inwardly converging part of one of the members 3. Pivotally mounted on this bracket 23 is a brake-operating lever 24 which has a ratchet 25 associated therewith for holding it in adjusted position.

The forward end of the frame is supported by a caster wheel 26. This wheel 26 is of the usual construction embodying a yoke 27 which is pivoted to a flat plate 28 for pivotal movement about an axis at right angles to the axis of rotation of the wheel. The plate 28 is pivoted for movement about the axis of pivot pin 6 in a vertical plane. The wheel can be locked in its lower or operative position by means of an upstanding lug 29, carried on the forward end of plate 28 which will project upwardly through an opening in a forwardly projecting stub member 30 which is welded to the transverse section 3a of the frame. A lock pin 31 may be passed transversely through lug 29 to lock the wheel 26 in operative position. With the wheel in this position, the frame is supported on three wheels and can be easily guided and maneuvered. The wheels 19 will be located slightly behind the center of gravity of the vehicle with the vault mounted thereon so that part of the weight of the vehicle will be supported on the wheel 26. To facilitate maneuvering of the vehicle by hand, a tongue 32 may be attached to the forward end of stub 30 by a removable pin 33 for movement in a vertical plane. Spacers 6a on member 6 keep the wheel 26 in centered position laterally of the frame. When the vehicle or trailer is to be attached to a truck or tractor, the pin 31 may be removed and the wheel 26 swung up to the dotted line position illustrated in Figure 2. Also, the tongue 32 may be removed by removing pin 33. The hitching pin on the truck or tractor may be passed through the opening in the stub 30 to hitch the trailer to the truck or tractor, or a hitch of the ball type or other suitable type may be associated with stub 30.

We provide hoisting mechanism on the frame 1 for raising and lowering the vault. This mechanism includes a pair of forward idler pulleys 34 (Figure 3) carried on opposite sides of the frame between the cross-members 10 and a pair of rearward idler pulleys 34a carried on opposite sides of the frame between the cross-members 12. As shown in Figures 3, 4 and 5, each of the pulleys 34

and 34a is canted inwardly. A transversely extending shaft 35 is rotatably mounted on upstanding supports 36 which extend upwardly from the transverse channel 16. This shaft extends through a housing 37 which is supported on the channel 16 midway between its ends and which contains worm and gear mechanism. This mechanism includes a worm gear 38 (Figure 6) keyed to shaft 35 and a worm 39 mounted on a longitudinally extending shaft 40. On each side of the housing 37, the shaft 35 has a cable drum 41 keyed thereon. Each drum includes two sections having oppositely directed helical grooves or cable guides formed therein. The rear pulleys 34a have cables 42 passing thereover and one end of each of these cables is anchored to one section of the co-operating drum 41. The forward pulleys 34 have cables 43 passing thereover and one end of each of these cables is anchored to the other section of the cooperating drum 41. Thus, with this arrangement when the shaft 35 is rotated, both drums 41 are rotated and the cables 42 and 43 are all reeled in or paid out simultaneously. The shaft 40 extends forwardly and is rotatably carried in a bearing 44 carried by a support upstanding from the forward transverse member 8. The extreme forward end of the shaft has a handwheel 45 keyed thereon. By turning the handwheel, the hoisting mechanism can be actuated and it will be noted that this handwheel is also at the forward end of the frame.

The lower end of each of the cables preferably has secured thereto a hook member 46. These hook members are adapted to be hooked into the eyes formed in the ends of cable straps 47 which are adapted to be passed beneath the vault to be lifted. It will be apparent that the vault can be lifted easily, after the vehicle is backed over it and the cables are attached, by operating the handwheel 45. The hoisting mechanism will be automatically locked when rotation of the handwheel 45 ceases because of the worm and gear mechanism. When the vault has been lifted upwardly within the frame, it is clamped in position to prevent swinging thereof. This is accomplished by positioning the clamping bar 13 on the rear of the frame in front of members 5. An adjustable clamping unit 48 is provided adjacent the forward end of the frame for clamping the vault against bar 13.

The clamping unit 48 comprises a vertically disposed supporting plate 49 which is welded between cross members 7 and 9 (Figure 1). This plate has a screw 50 (Figures 1 to 3) threaded therethrough in a horizontal direction. The rear end of this screw 50 rotatably carries a vault-engaging plate 51 which is preferably provided with a roughened vault-engaging surface.

The forward end of the screw 50 has a handwheel 52 keyed thereon. It will be noted that this wheel 52 is also readily accessible from the forward end of the frame. To clamp the cable-suspended vault in position on the frame it is merely necessary to rotate wheel 52 to move plate 51 rearwardly into contact with the forward end of the vault and to continue the rotation until the vault shifts bodily rearwardly so that its rear end will be in firm contact with the clamping bar 13 which will be forced against vertical members 5. Thus, during transportation the vault will be effectively clamped to the frame to prevent swinging thereof.

The frame is provided at each side with three U-shaped brackets 53 which are welded to the vertical members 4, 15 and 5, respectively. The

set of brackets at each side is adapted to receive and carry a plank 54. The planks 54 may be removed from the frame, when the grave is reached, and placed along the side thereof to serve as tracks for the wheels 19.

When the grave is reached, the trailer is disconnected from the truck or tractor and the caster wheel 26 is swung downwardly into operative position and locked in such position as shown in Figure 1. Then the tongue 32 may be attached and by using it, the trailer can be maneuvered and backed over the grave, as shown in Figures 1 and 5. Because the rear end of the vehicle is free of any obstructions lower than the vault carried thereby, the vehicle may be backed over the grave without interfering with a marker of the headstone type. As soon as the vehicle is properly positioned over the grave, the lever 24 is actuated to set the brakes. The handwheel 52 is then operated to move the clamping plate 51 out of contact with the vault. The bar 13 may then be removed. The vault can then be lowered easily into the grave by operating the handwheel 45, or in the case of a disinterment the vault may be raised. If desired, a platform may be provided on top of the trailer for transporting equipment to the grave, such as artificial grass, tent equipment, matting, etc. This platform may embody a frame 1a which is removably attached to frame 1 by brackets 55 and which supports a plurality of longitudinal slats 56. Brackets 55 are carried by frame 1a and straddle the upper members 2 of the frame to which they are secured by removable pins 57.

It will be apparent from the above description that we have provided a vault-handling vehicle having a number of advantages. Most of these advantages have been discussed above but others will be apparent.

Having thus described our invention, what we claim is:

1. A vault-handling vehicle comprising a frame carried by transporting wheels, cable means for suspending and supporting a vault from said frame, and means associated with said frame for gripping the vault to prevent swinging thereof relative to the frame, said means comprising a clamping bar at one end of the frame for contacting with the associated end of the vault, and a clamping unit adjustably carried by the other end of the frame and having a clamping member adapted to be moved into contact with the associated end of the vault to clamp the suspended vault between said clamping member and said clamping bar.

2. A vault-handling vehicle comprising a frame carried by transporting wheels, cable means for suspending and supporting a vault from said frame, and means associated with said frame for gripping the vault to prevent swinging thereof relative to the frame, said means comprising a clamping bar disposed transversely at one end of the frame and being notched to removably fit over longitudinal members of the frame, said clamping bar being adapted to engage upright members carried by said longitudinal members of the frame and to engage the associated end of the vault, and a clamping unit carried by the other end of the frame, said clamping unit comprising a gripping plate for engaging the associated end of the vault, said plate being rotatably carried on the end of a screw, said screw being threaded through a portion of the frame for axial movement relative thereto.

3. A vault-handling vehicle comprising a frame

fabricated from metal members and including a plurality of longitudinally extending members which converge at the forward end thereof, said frame being supported by a pair of rear wheels disposed behind the center of gravity of the frame and a caster wheel attached to the forward end of the frame, cable means for suspending and supporting a vault from said frame, said cable means including cable drums mounted on a transversely disposed shaft supported by the frame intermediate the ends thereof and on the upper side thereof, means for rotating said drums including worm and gear mechanism, idler pulleys for receiving the cables and disposed at the corners of the frame at the upper side thereof, means for clamping the cable-suspended vault to the frame to prevent swinging thereof, said means comprising a removable clamping bar at one end of the frame for contacting with the associated end of the vault, and a clamping unit adjustably carried by the other end of the frame and having a clamping member adapted to be moved into contact with the associated end of the vault.

4. A vehicle according to claim 3 wherein the caster wheel is pivoted to the forward end of the frame for movement in a vertical plane, and locking means is associated therewith for locking it in its lowermost position.

5. A vehicle according to claim 3 wherein the clamping bar is notched to fit over longitudinal members of the frame and wherein the clamping unit comprises a screw adjustably carried by the frame and rotatably carrying a vault-engaging plate.

6. A vehicle according to claim 3 wherein brakes are provided on the rear wheels, a control member for said brakes, a control member for said worm and gear mechanism and a control member for said clamping unit, all of said control members being disposed at the forward end of the frame.

7. A vault-handling vehicle comprising a frame composed of longitudinal vertical and transverse frame members secured together to form a frame between which the vault may be lifted, cable means on the frame for lifting and supporting the vault within the frame, said frame being supported on a pair of rear wheels disposed behind the center of gravity of the frame, brakes associated with the rear wheels, all of the longitudinal members of the frame converging at the forward end thereof to provide a support for a caster wheel being pivotally mounted for vertical movement between a lower operative position and an upper inoperative position, means for locking the caster wheel in operative position, a control for said brakes at the forward end of the frame, a control for the cable means at the forward end of the frame, and a clamping unit at the forward end of the frame for clamping the vault to the frame to prevent swinging thereof.

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