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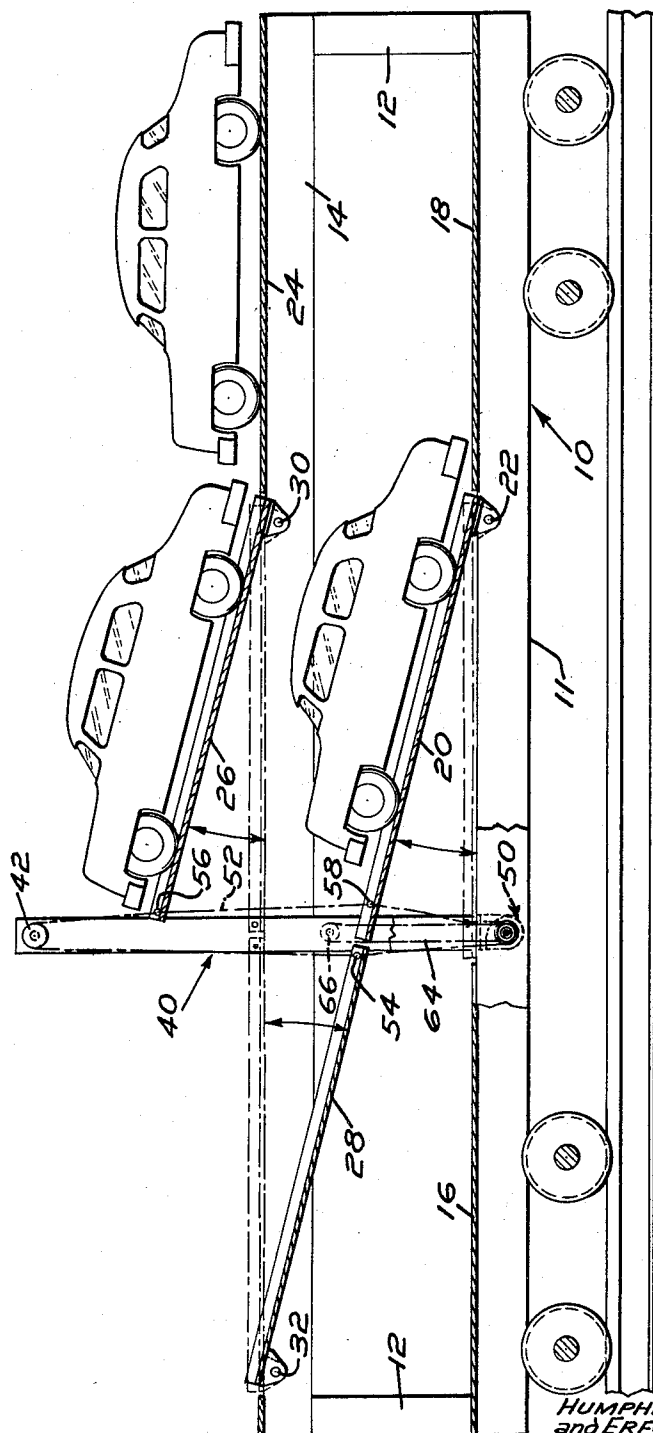
2,959,262

HOIST

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4 Sheets-Sheet 1

FIG. 1



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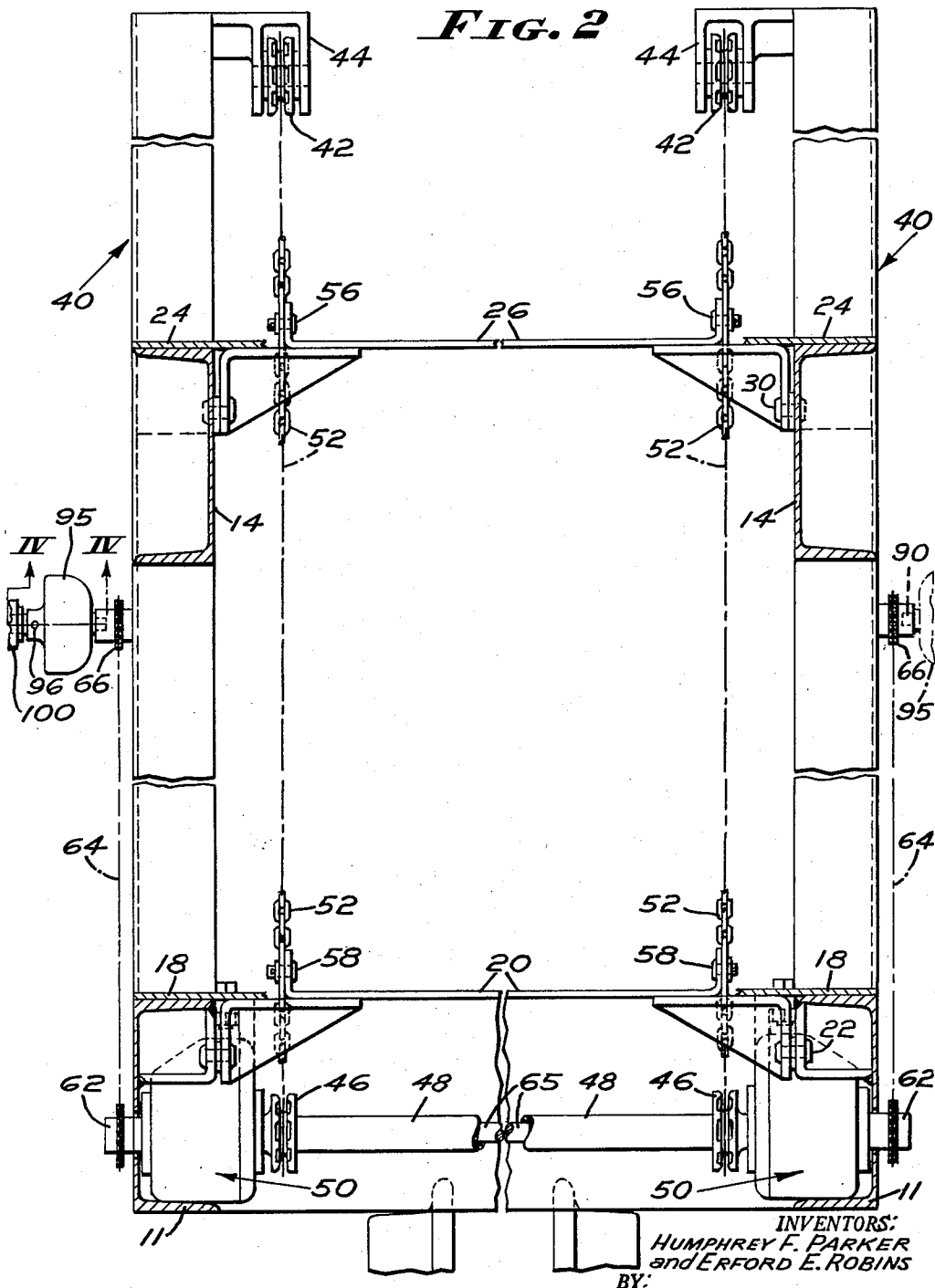
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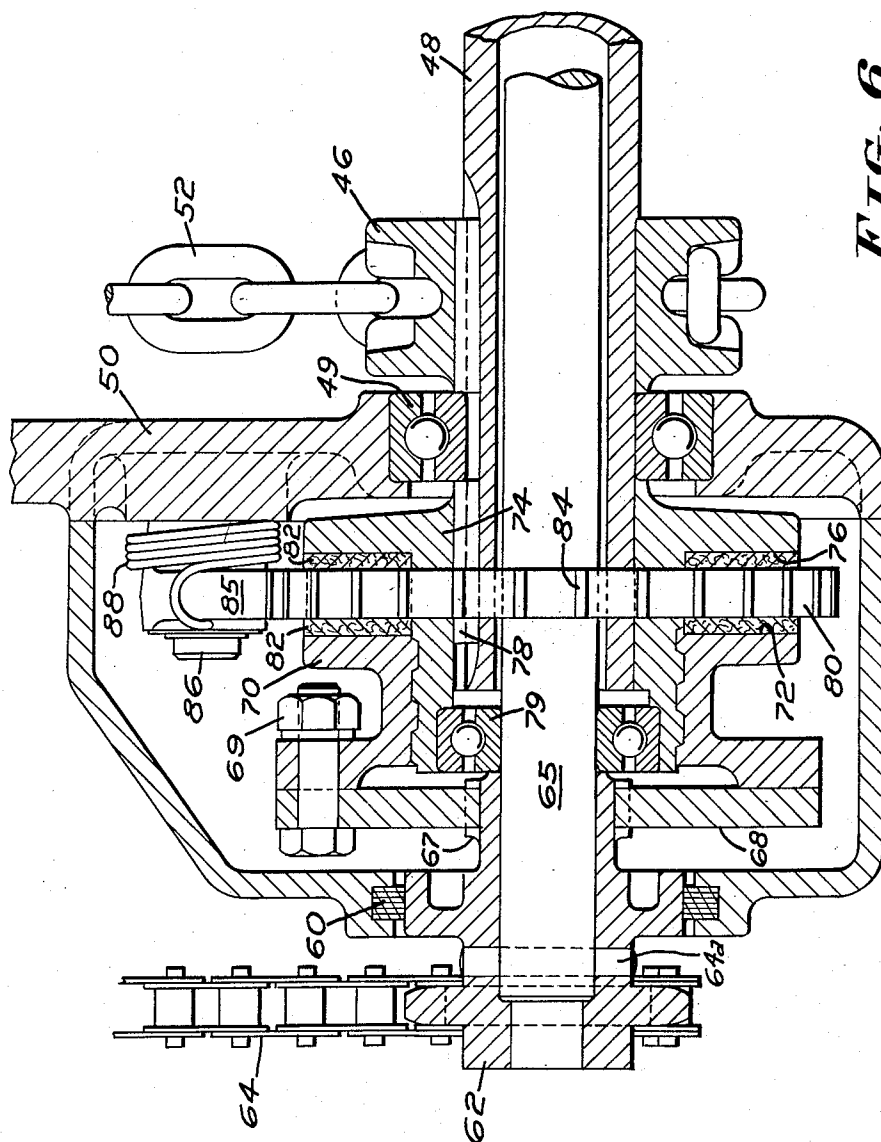


FIG. 6

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2,959,262

HOIST

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3 Claims. (Cl. 192—4)

This invention relates to railway transport means for automobiles or the like, and more particularly to an improved hoist arrangement in freight cars having vertically hinging racks for carrying automobiles or the like in multiple level stored relation.

It is a primary object of the invention to provide, in a railway car type transport means for automobiles or the like, an improved rack hoist arrangement and control means therefor whereby increased efficiency and speeds of operation may be obtained.

Other objects and advantages of the invention will appear from the specification hereinafter.

In the drawing:

Fig. 1 is a longitudinal sectional view of a railway flat car mounting an automobile support rack hoist arrangement of the present invention, wherein the floor sections are shown in ramp positions;

Fig. 2 is a fragmentary section, on an enlarged scale, taken along line II—II of Fig. 3, but showing the floor sections in horizontal positions;

Fig. 3 is an enlarged scale view, of a detail of Fig. 1;

Fig. 4 is a sectional view, on a large scale, taken along line IV—IV of Fig. 2;

Fig. 5 is an end elevational view of the mechanism of Fig. 4; and

Fig. 6 is a fragmentary sectional view, on an enlarged scale, taken along line VI—VI of Fig. 3.

As illustrated in Fig. 1 of the accompanying drawing, a mechanism of the present invention may be embodied for example in a railway automobile transport device comprising generally a conventional type railway flat car 10 including bottom sills 11 and vertical end posts 12 which in turn mount upper sills 14—14 at opposite sides of the car and paralleling the bottom sills 11—11. The bottom sills 11—11 support stationary bottom floor sections as indicated at 16 and 18, and a centrally disposed pivotable floor section or ramp 20 normally rests upon the bottom sills but is vertically pivotable as indicated at 22. The upper sills 14—14 mount a stationary floor section 24 above the bottom floor section 18; a centrally disposed vertically swinging floor section or ramp 26 positioned above the hinged floor section 20; and a downwardly swingable floor section or ramp 28 which is disposed above the stationary bottom floor section 16. The ramp sections 26, 28 are pivotally mounted upon the upper sill structure, as indicated at 30 and 32, respectively.

A pair of ramp control posts designated generally at 40—40 are based upon the bottom sills 11—11 and fixed to the upper sills 14—14 to extend vertically at opposite sides of the railway car; terminating at their upper ends at an elevation above the level of the upper sills 14—14 (Fig. 1). Each post mounts at its upper end a chain sheave 42, as by means of a bracket 44; and corresponding bottom sheaves 46—46 are carried by a hollow shaft 48 which extends transversely of the car frame and is journaled at its opposite ends by means of bearings 49 (Fig. 6) in corresponding housings 50—50 which are fixedly mounted at opposite sides of the car in the corre-

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sponding bottom sills 11—11. Endless chains 52—52 train around the upper and lower sheaves 42, 46; and as shown in Figs. 1, 2, and 3 one side strand of each chain 52 is fixed as indicated at 54 to the swinging rear end portion of the top ramp 28; while the opposite side strand of each chain 52 is fixed as indicated at 56—56 to corresponding front end portions of the upper swinging ramp 26, and also as indicated at 58, 58 to the swinging front end portion of the bottom ramp 20. Thus, it will be appreciated that rotation of the drive shaft 48 alternately in opposite directions will cause the chains 52—52 to move to either simultaneously raise the ramp sections 20 and 26 while lowering the section 28 as to the solid line position thereof shown in Fig. 1; or, to raise the ramp portion 28 while lowering the ramp portions 20, 26 until all ramp portions of the structure are disposed horizontally, as shown in broken lines in Fig. 1.

The railway car structure and the ramp sections thereof are so dimensioned and relatively arranged that the automobiles to be transported may be successively driven or pulled or pushed onto the stationary bottom floor section 18, as from some conveniently adjacent ramp or loading platform; while the swinging ramp portions of the device are disposed in their solid line positions as shown in Fig. 1.

Thus, each of the first three automobiles to be loaded on the railway car may be successively run up the inclined ramp provided jointly by the ramp sections 20, 28, until the automobile stands totally on the ramp section 28, whereupon the chains 52—52 are motivated (as will be explained hereinafter) so as to then lift into horizontal position the ramp section 28 while at the same time lowering into horizontal alignment therewith the ramp section 26. The first two automobiles are then run rearwardly onto the upper floor sections 24, 26, respectively, and the third automobile to be moved up the joint ramp sections 20, 28 is then left to stand upon the ramp section 28 which is subsequently moved upwardly into its horizontal position. The bottom tier section of the railway car will then accommodate three more automobiles which may be simply run onto the level floor area since the ramp section 20 is now lowered into its horizontal position while the ramp section 28 has been pulled up into its horizontal position. Unloading of the railroad car at destination will of course be accomplished by simple reversal of the hereinabove described loading procedure.

The present invention features novel means for controlling operations of the load raising and lowering chains 52—52. As illustrated in better detail in Fig. 6, each housing 50 rotatably supports by means of bearing 79 a power shaft 65 to which is keyed by means of a pin 64A, a sprocket device 62. The power shaft 65 extends through the hollow shaft 48 and therebeyond at opposite sides of the railway car; the shaft 65 thus carrying a chain sprocket 62 to extend at each side of the railway car structure (Fig. 2). The sprockets 62—62 are each arranged to be driven by a corresponding endless chain 64 which trains over a drive sheave 66 which is rotatably mounted on the corresponding side post 40. Thus, rotation of either of the chain sheaves 66, 66 by any suitable means under manual control of the loading operator, will cause the drive shaft 65 to be driven to rotate with results to be explained hereinafter.

Each housing 50 encloses a "Weston brake" device of the type disclosed for example in U.S. Patent 2,493,727, comprising parts numbered 40—55 therein.

As shown in Fig. 6 herein, the Weston brake device comprises a splined hub portion 67 formed on the sprocket 62, which slidably engages a floating plate 68 to which is bolted, as indicated at 69, an internally threaded hub 70 having a flange face 72. The threaded bore of the hub 70 engages in screwthreaded relation upon an ex-

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ternally threaded sleeve 74; the sleeve 74 being provided also with a flange face 76 opposing the flange face 72 of the hub 70. The sleeve 74 is keyed as indicated at 78 to the hollow shaft 48, and is mounted for partial rotation over the inner shaft 65, as by means of the bearing 79.

A ratchet plate as indicated at 80 is rotatably mounted upon the sleeve 74, and is faced with annular friction bearing surfaces 82—82 which in turn bear against the flange faces 72, 76, respectively. The periphery of the plate 80 is ratchet-toothed as indicated at 84, and a ratchet pawl 85 is pivotally mounted upon the housing 50, as by means of a pin 86 and is spring-controlled by means of a coil spring 88 so as to permit rotation of the plate 80 in one direction while prohibiting its rotation in the other direction.

Thus, for example, if power is applied to the drive chain 64 at the left side of the railway car as viewed in Fig. 6, in such direction as to cause the sprocket 62 to rotate in clockwise direction as viewed from the left hand side of Fig. 6, the threaded hub 70 will be thereby driven to rotate relative to the threaded sleeve 74 so as to cause the hub 70 to snug itself toward the ratchet plate 80. This action tightens the clutching engagement with the surfaces of the annuli 82—82 thereby transmitting the drive power from the chain 64 into the hollow shaft 48 to cause the latter to rotate the chain drive wheels, 46, 46 at opposite sides of the car. Thus, the lift chains 52, 52 are motivated to provide the automobile ramp elevating and lowering operations hereinabove described in one direction; it being understood that the ratchet device 80 and 85 is so arranged as to permit such rotation under this condition of operation. However, reverse direction operations of the left hand chain sprocket 62 will cause the threaded hub 70 to "travel" upon the threaded sleeve 74, thereby loosening the friction brake action in the device 50 at the left hand side of the car as viewed in Fig. 6, while the corresponding hub 70 in the device 50 at the opposite or right hand side of the car snugs itself against its ratchet plate and friction discs and thereby acts to drive the chains 52—52 to travel in reverse direction to reversely actuate the hinged ramps for the purposes explained hereinabove.

Thus, it will be appreciated that by reason of the use of two oppositely directed "Weston" brake clutch devices (50—50) on the power output shaft 48, the loads may be alternately lifted and lowered with utmost facility by simple corresponding rotations of either of the power chains 64—64; the friction brake-clutch devices operating alternatively to permit intended actuations of the ramps while preventing any load feed-back or otherwise unintended actuations thereof.

It will also be appreciated of course that the mechanism of the invention may be readily operated from either side of the railway car with equal facility, and without relative interferences between the driving devices at opposite sides of the car. Whereas, any simple handcrank device or the like may be employed to drive the sprockets 66—66, a preferred form of drive device is illustrated in Figs. 2, 3, 4, 5. This mechanism comprises a square-ended bit 90 shaped to spline-fit into a complementary-shaped socket in the drive sprocket 66; the bit 90 being formed with a friction flange 92 against which bears a drive disc 94. The disc 94 is driven by a housing 95 which is pinned (96) to a tapered shank 98 engaging the rotor shaft 99 of an electric motor 100. Thus, the motor and drive unit 95 may be manually slip-fitted into operative position and operated to rotate the sprocket 66 as explained hereinabove, in lieu of a manual operation for driving the chains 64. As shown in Fig. 4, the friction flanges 92 and 94 are preferably biased into driving relation by a resilient spring 102 which is so selected and adjusted as to permit the flanges to slip in event of an "overload" on the system. Thus, a safety factor is automatically provided against possibility of damage to the mechanism in event of jamming or other malfunctioning thereof.

Although only one form of the invention has been

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shown and described in detail, it will be apparent to those skilled in the art that the invention is not so limited but that various changes may be made therein without departing from the spirit of the invention or the scope of the appended claims.

We claim:

1. A unit hoist device comprising a pair of endless hoist chains each coupled to a common load lift means, a power tube extending transversely of the unit and mounting drive sprockets at opposite ends thereof in engagement with said endless chains for powering the latter in reversible direction operations, a power supply shaft disposed within said power tube and extending at opposite ends thereof, power supply means engaging opposite ends of said shaft for selective rotation thereof in either direction, and a pair of brake-clutch devices interengaging said drive shaft and said power supply tube, said brake-clutch devices being disposed in oppositely operative relation whereby rotation of said shaft in one direction causes one of said brake-clutch devices to lock and drive said power tube in one direction, while rotation of said shaft in the other direction causes the other of said brake-clutch devices to lock and drive said tube to rotate in the other direction, said one brake-clutch device being effective to rotate said tube in load-lifting direction and including ratchet means permitting only such load-lifting direction of rotation of the tube while the supply shaft is coupled to said tube through such one brake-clutch device, whereby upon cessation of power input to said one brake-clutch device during a load-lifting operation, said ratchet means holds said tube against load feed back.

2. A unit hoist device comprising a pair of endless hoist chains each coupled to a common load lift means, a power delivery shaft mounting drive sprockets in driving engagement with said endless chains for powering the latter in reversible direction operations, a power supply shaft arranged for selective rotation thereof in either direction, and a pair of brake-clutch devices interengaging said delivery shaft and said power supply shaft, said brake-clutch devices being disposed in oppositely operative relation whereby rotation of said supply shaft in one direction causes one of said brake-clutch devices to lock and drive said delivery shaft in one direction, while rotation of said supply shaft in the other direction causes the other of said brake-clutch devices to lock and drive said delivery shaft to rotate in the other direction, said one brake-clutch device being effective to rotate said delivery shaft in load-lifting direction and including ratchet means permitting only such load-lifting direction of the delivery shaft while the supply shaft is coupled to said delivery shaft through such one brake-clutch device, whereby upon cessation of power input to said one brake-clutch device during a load-lifting operation, said ratchet means holds said delivery shaft against load feed back.

3. A unit hoist device comprising a pair of load lift devices adapted to be coupled to a common load, a power tube extending transversely of the unit and mounting drive sprockets at opposite ends thereof in driving engagement with said lift devices for powering the latter in reversible direction operations, a power supply shaft disposed within said power tube and extending at opposite ends thereof, power supply means engaging opposite ends of said shaft for selective rotation thereof in either direction, and a pair of brake-clutch devices interengaging said drive shaft and said power supply tube, said brake-clutch devices being disposed in oppositely operative relation whereby rotation of said supply shaft in one direction causes one of said brake-clutch devices to lock and drive said power tube in one direction, while rotation of said supply shaft in the other direction causes the other of said brake-clutch devices to lock and drive said tube to rotate in the other direction, said one brake-clutch device being effective to rotate said power tube in load-lifting direction and including ratchet means permitting only such load-lifting direction of rotation of the power tube while the supply shaft

is coupled to said power tube through such one brake-clutch device, whereby upon cessation of power input to said one brake-clutch device during a load-lifting operation, said ratchet means holds said power tube against load feed back.

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