

April 11, 1967

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3,313,432

WRECKER TRUCKS

Filed April 2, 1964

3 Sheets-Sheet 1

FIG. 1

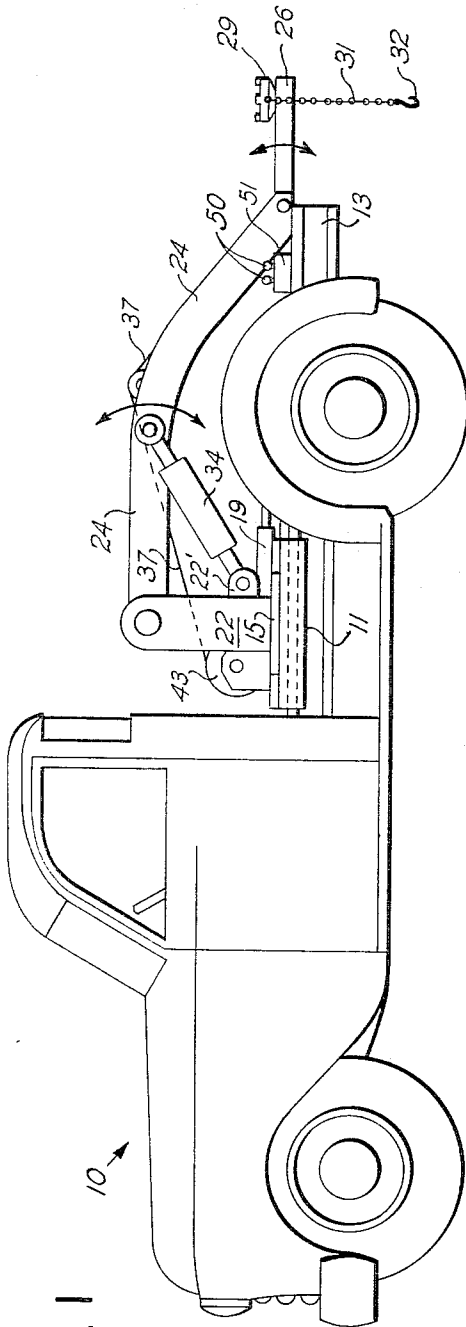
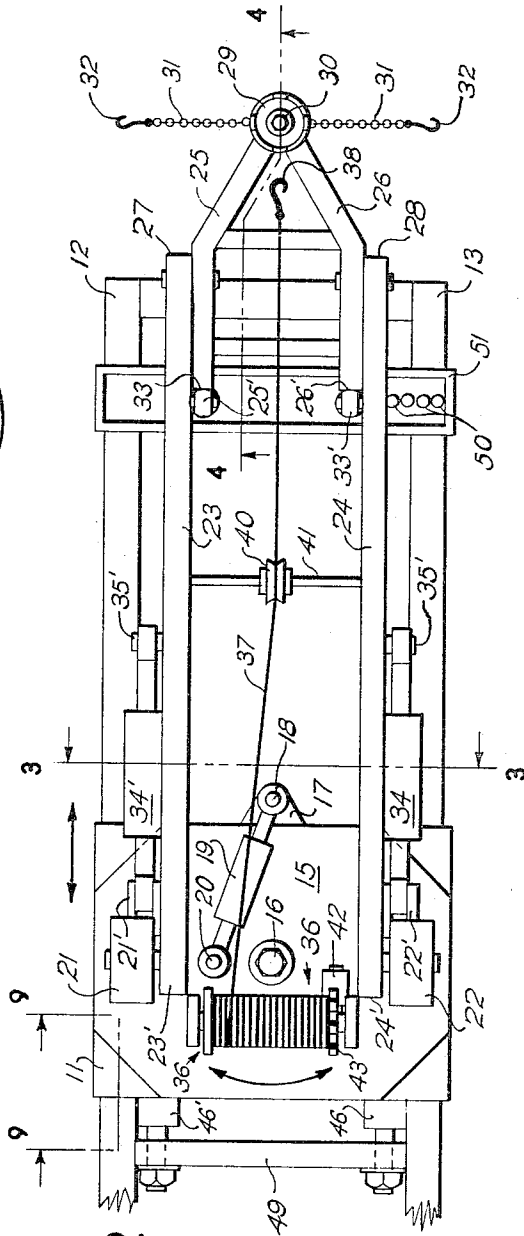


FIG. 2



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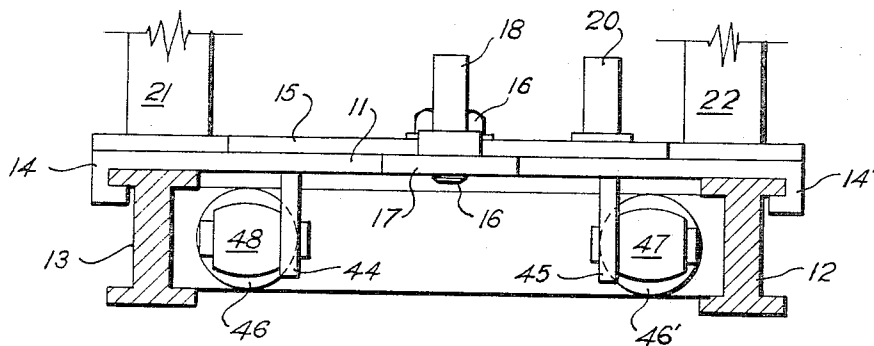


FIG. 3

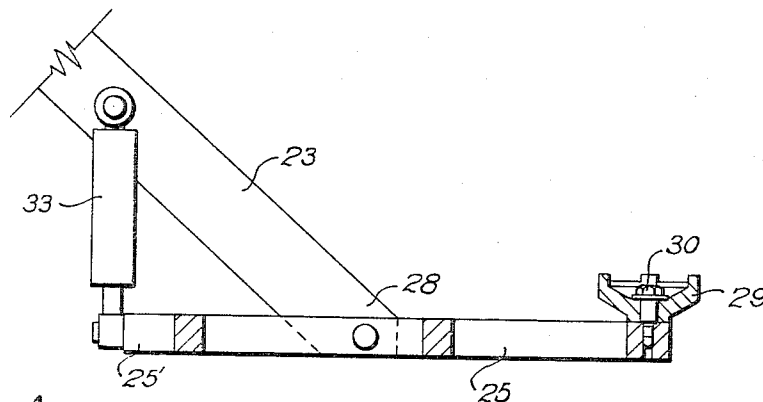


FIG. 4

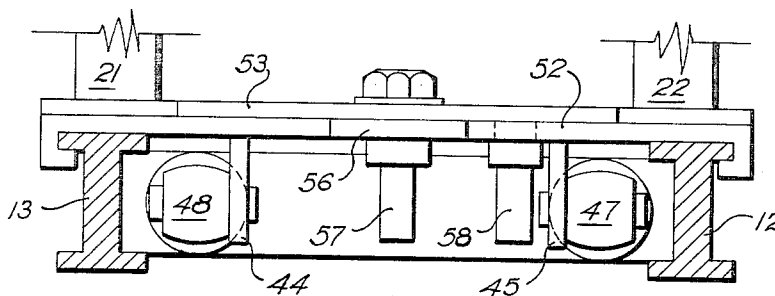


FIG. 5

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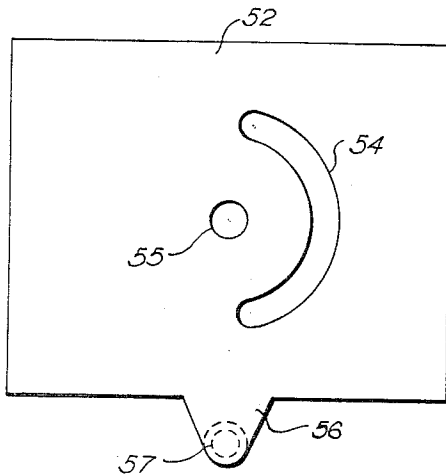


FIG. 6

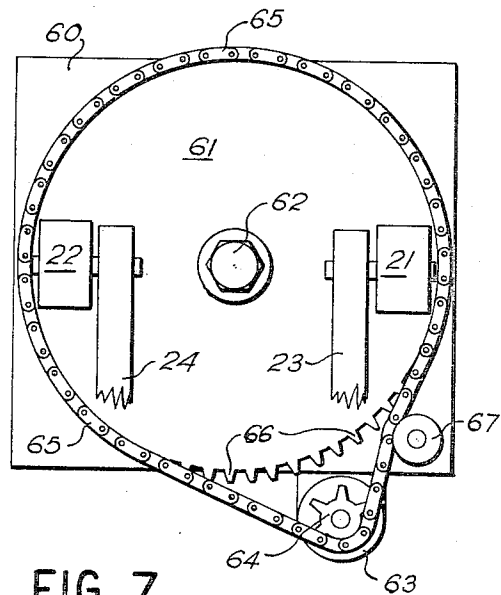


FIG. 7

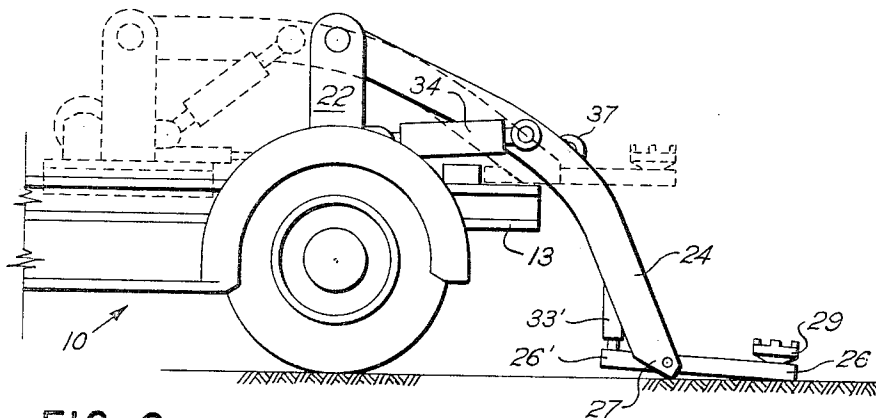


FIG. 8

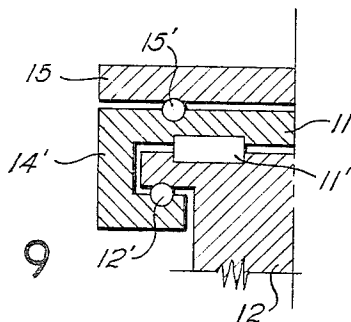


FIG. 9

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WRECKER TRUCKS

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14 Claims. (Cl. 214-146.5)

My invention relates to improvements in lifting or wrecker trucks, for example, such as those used in picking up damaged motor driven vehicles wherever the same may become disabled. My invention, furthermore, is an improvement in the versatility of such trucks in that the lifting mechanism thereof can be moved longitudinally relative to the length of the truck, can be rotated from one side to the other relative to the truck or can be moved longitudinally and rotated depending upon the requirements of the particular pick up job.

One of the objects of my invention is to provide a wrecker truck capable of lifting disabled vehicles which can provide selected longitudinal and/or rotated position of its lifting mechanism.

Another object of my invention is to provide a wrecker truck which is preferably completely hydraulic in its major lifting components.

A further object of my invention is to provide a lifting truck mechanism which is capable of readily picking up vehicles provided with bodies and structures that are easily warped or cracked without causing damage to such vehicles.

A still further object of my invention is to provide a lifting mechanism which is controllable from one place and which can be controlled in any one of its movements without affecting the selected attitude of any of its other movements.

Other and further objects of my invention will appear from the following specification, drawings and claims.

Referring to the drawings:

FIG. 1 is a side elevation of my wrecker truck, showing the lifting mechanism in its normal attitude relative to the truck when it is not in use.

FIG. 2 is a fragmentary top plan view on an enlarged scale, showing the various components of the lifting mechanism, the tow cable, the bit and the securing elements.

FIG. 3 is a fragmentary sectional end elevational view on an enlarged scale in the direction of the arrows along line 3-3 of FIG. 2.

FIG. 4 is a fragmentary sectional side elevational view of the pick up arms in the direction of the arrows along line 4-4 of FIG. 2.

FIG. 5 is a fragmentary sectional end elevational view at the same point as that of FIG. 3, showing a modification of the turntable and carriage elements.

FIG. 6 is a top plan view of the modified carriage shown in FIG. 5, enlarged to a smaller scale than FIG. 5, showing the arcuate slot and hydraulic cylinder attachment arrangement for the said carriage modification.

FIG. 7 is a top fragmentary plan view on an enlarged scale of a modified version for the turntable and carriage elements of the lifting mechanism.

FIG. 8 is a fragmentary side elevational view of the wrecking truck, showing the lifting mechanism resting on the ground with the dotted lines showing the lifting mechanism in the normal position it will occupy when not being used.

FIG. 9 is a fragmentary sectional end elevational view in the direction of the arrows along line 9-9 of FIG. 2, showing optional bearings between the carriage, turntable and frame.

Referring further to the drawings:

The wrecker truck 10 is provided with a carriage 11 which is positioned upon and movable along the frame

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members 12 and 13 of the truck chassis in such a manner that it cannot be displaced laterally of said frame members by providing the sides 14 and 14' of said carriage in the shape of lips which cooperate with the flanges of the frame members 12 and 13 or with a track member secured to the truck. A turntable 15 is pivotally attached to the carriage 11 by any suitable means such as heavy duty shoulder screw 16 positioned centrally of the carriage 11. Said carriage is also provided with a tongue 17, projecting in its plane, which in turn is provided with a pin 18 extending vertically above the upper surface of said carriage and tongue a sufficient distance to journal thereto one end of a double acting, hydraulic ram cylinder 19. The opposite end of said hydraulic ram cylinder 19 is journaled to pin 20 secured on turntable 15 at a point, spaced away from pivotal attachment 16. The carriage turntable and frame members 12 and 13 may be provided with heavily coated grease or bearings 11', 12' and 15', best shown in FIG. 9, whenever said elements could be in frictional contact with each other.

Two standards 21 and 22 are secured in diametrically spaced relation on said turntable 15. Boom arms 23 and 24 are journaled near the upper ends of standards 21 and 22, respectively, at their ends 23' and 24'. Two pick up arms 25 and 26 are journaled medially thereof to ends 27 and 28, respectively, of boom arms 23 and 24 and so arranged that said pick up arms 25 and 26 converge at their rearmost ends to form a base for the bit 29 which is pivotally attached by means such as a shoulder screw 30 to said base on the pick up arms 25 and 26. Chains 31 provided with securing means such as grab hooks 32 are secured in diametrically spaced positions on the peripheral sides of said bit 29. Double acting, hydraulic ram cylinders 33 and 33' are journaled at one end near the foremost ends 25' and 26', respectively, of the lift arms 25 and 26, said cylinders 33 and 33' are also journaled at their other ends to the boom arms 23 and 24, respectively. Large capacity, double acting, hydraulic ram cylinders 34 and 34' are journaled at 21' and 22', respectively, to the standards 21 and 22 near the bases thereof; and at their other ends said cylinders 34 and 34' are journaled to the boom arms 23 and 24 medially thereof, such as at 35 and 35', respectively. A winch 36 is mounted or secured on the turntable 15 between standards 21 and 22 and forwardly of the pivotal attachment element 16 of carriage 15. Said winch is provided with a cable 37 having a grab hook 38 secured at its loose end. Cable 37 rides over an idler pulley 40 which is journaled upon a supporting shaft 41 between boom arms 23 and 24. The winch 36 is powered by a reversible oil motor 42 which engages one of the flanges 43 of the winch drum by means of complementary gearing, or other suitable means. The carriage 11 is also provided with two depending lugs 44 and 45 secured in spaced relation to its lower surface. Large capacity, double acting, hydraulic ram cylinders 46 and 46' are journaled at 47 and 48 to lugs 45 and 44, respectively. The opposite ends of said cylinders 46 and 46' are secured to member 49 of the frame, or other suitable place.

All of the hydraulic cylinders 19, 33, 33', 34, 34', 46 and 46' are connected by conventional piping and hoses and by conventional circuitry to plurality of controls 50 positioned near the rear of frame members 12 and 13 in control box 51. The plurality of controls 50, in turn, are connected by conventional means to a source of hydraulic fluid under pressure, preferably from power supplied by the engine of truck 10.

The preferred connection arrangement of controls 50 to the various hydraulic cylinders is such that moving each control lever in one direction will cause the component it controls to move in a given direction, and moving the same levers in the opposite direction will actuate

the components they control in the opposite direction. A neutral positioning of any of the controls 50, such as vertical between opposing directions of motion, will stop the component affected at the point at which it is positioned.

The modified carriage 52 and modified turntable 53 shown in FIGS. 5 and 6 of the drawings are the same as carriage 11 and turntable 15 with the exception that modified carriage 52 is provided with a concentric arcuate slot 54 partially circumscribing the central, pivotal mounting hole 55 through carriage 52. The tongue 56 of the carriage is provided with a pin 57 which depends vertically from said tongue and to which is journaled a double acting, hydraulic ram cylinder, not shown in FIGS. 5 and 6, which cylinder could be exactly the same as 19 shown in FIGS. 1 and 2 of the drawings, except for its being positioned beneath the carriage. The other end of such double acting, hydraulic ram cylinder is journaled to pin 58 secured to the underside of the modified turntable 53 to depend through and cooperate with the arcuate slot 54. The turntable 53 is pivotally attached to carriage 52 by shoulder bolt 59, or other suitable means. In all other respects the modified carriage 52 and turntable 53 would be the same as carriage 11 and turntable 15.

A further modified carriage 60 and turntable 61 are shown in FIG. 7 of the drawings. In this modification the carriage 60 is provided with means for pivotally attaching turntable 61 centrally thereof, such as shoulder screw 62. A reversible oil motor 63 is secured to carriage 60 and is provided with a driving sprocket 64 which engages with and drives chain 65. The chain 65 wraps around the periphery of turntable 61 and engages with teeth 66 on the peripheral edge thereof, so that operation of the oil motor 63 will enable turning turntable 61 through approximately 180 degrees relative to carriage 60. An idler 67 may also be provided on turntable 61 to keep proper tension on chain 65 and to cause it to maintain a good wrap around the teeth 66 on the peripheral edge of turntable 61. In all other respects the modified carriage 60 and turntable 61 are the same as carriage 11 and turntable 15.

The modified turntables 53 and 61 shown in FIGS. 5 and 7 of the drawings are provided with standards 21 and 22 which pivotally support boom arms 23 and 24 in the same manner and relationship as shown in FIGS. 1 and 2 of the drawings. Modified carriages 52 and 60 are also provided with depending lugs 44 and 45 secured to their lower surfaces to accommodate large capacity, double acting hydraulic ram cylinders, such as 47 and 48 shown in FIGS. 2 and 3 of the drawings. These hydraulic cylinders are connected to the depending lugs 44 and 45 of the modified carriages and are secured to an appropriate part of the truck frame, so that they can exert a push or pull on the modified carriage elements.

Although no view is shown on the drawings depicting such an arrangement, it is to be understood that the reversible oil motor 63 may be provided with a driving gear member, instead of the driving sprocket 64, which engages with complementary gear teeth provided on the peripheral edge of turntable 61 instead of sprocket teeth 66, so that said turntable may be reversibly rotated through approximately 180 degrees by operation of the reversible oil motor 63.

In operation the lifting elements of my wrecker truck will be controlled through the manipulation of the plurality of control levers 49 positioned in control box 50. These controls, as described hereinabove, are connected to a reservoir supplying hydraulic fluid under pressure, so that each control will impart the desired motion to the various elements of the lifting mechanisms. For example, upon arriving at the location of a disabled vehicle the truck operator will first position the proper control lever of the plurality of controls 50 to lift the boom arms 23 and 24 slightly above frame members 12 and 13 and then will position the control lever of the plurality of

controls 50 which will cause the double acting, hydraulic ram cylinders 47 and 48 to move carriage 11, 52 or 60, as the case may be, rearwardly along frame members 12 and 13 of the truck until operation of the boom control of the plurality of controls 50 will enable lowering the boom arms down to the ground surface. After lowering of boom arms 23 and 24 the carriage may be rotated, if necessary, by means of the control lever 50 which controls double acting, hydraulic ram cylinder 19 or oil motor 63, as the case may be, to obtain proper alignment of the lifting mechanism with the disabled vehicle. The control lever 50, which controls double acting, hydraulic ram cylinders 33 and 33', may then be actuated, so that the foremost ends 25' and 26' of lifting arms 25 and 26 are raised sufficiently to bring the rearmost ends of said arms into contact with or closer to the ground. Thereafter, the carriage 11, 52 or 60, as the case may be, together with the lifting components and the turntable disposed thereon, may be moved further toward the rear of the truck and slid into engagement with an appropriate structural member, such as the front cross member to which the front wheel suspension is attached, the front axle or the differential housing, etc. Securing chains 31 and grab hooks 32 are wrapped around axles or frame members and hooked into themselves to secure the vehicle to pivotally mounted bit 29 of the lifting arms. At this point cable 37 may be secured to some convenient portion of the disabled vehicle by means of its hook 38 to secure the vehicle further against coming loose. By reversing control levers 50 in the desired sequential order lift arms 25 and 26 and boom arms 23 and 24 may be caused to raise the disabled vehicle until the end being picked up clears the ground, preferably by enough distance to enable imparting longitudinal motion of carriages 11, 52 or 60, as the case may be, toward the front of the truck 10, thereby pulling the disabled vehicle to the wrecker truck until boom arms 23 and 24, if desired, may again rest upon frame members 12 and 13. There will be some occasions upon which it will be found desirable to hook cable 37 and its hook 38 onto the disabled vehicle, so that moving the control 50 which operates oil motor 42 will activate winch 43, and pull the disabled car up to the lifting mechanism or assist in pulling the disabled vehicle into position over bit 29. After towing the disabled vehicle to its delivery point it may be lowered by the procedures hereinabove described for lowering the boom arms to the ground. When the securing elements and tow cable have been disengaged, the lifting mechanism may be returned to its normal inactive position on the frame members 12 and 13 and the cable 37 may be reeled in by moving the appropriate controls 50.

The foregoing description of my invention and modifications of the carriage and turntable elements thereof merely sets forth presently preferred embodiments of my wrecker truck and is not to be understood to limit me to the specific embodiments disclosed, for it is apparent that numerous modifications and variations of my invention are feasible without departing from the spirit or scope of the specification, drawings and appended claims. It is, further, to be understood that mechanical means may be substituted for the hydraulic elements of this invention without departing from its spirit and scope.

Having thus described my invention, I claim:

1. In a wrecker truck: a carriage; means tracking said carriage; a turntable pivotally attached to said carriage; a boom; means pivotally attaching said boom to said turntable; lift arms pivotally attached to one end of said boom; pick up and securing means pivotally attached to said lift arms; a winch, provided with a cable and hook, secured to said turntable; means moving said carriage along said means tracking said carriage; second means moving said turntable rotationally clockwise and counterclockwise on said carriage; third means moving said lift arms vertically rotational to said boom; fourth means moving said boom vertically rotational to said turntable; fifth means moving

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said winch; and controls controlling each of said means moving said carriage, turntable, boom, lift arms and winch.

2. In a wrecker truck: a carriage; means tracking said carriage longitudinally on a truck; a boom; means pivotally attaching said boom to said carriage; lift arms pivotally attached near one end of said boom; pick up and securing means pivotally attached to said lift arms; a winch, provided with a cable and hook, secured to said carriage; means moving said carriage along said tracking means; second means moving said lift arms rotationally to said boom; third means moving said boom rotationally to said carriage; fourth means actuating said winch; and means controlling the movement, selectively, of said carriage, boom, lift arms and winch.

3. A wrecker truck of the character described in claim 1 in which said means moving said carriage, turntable, boom, lift arms and winch are hydraulic means.

4. A wrecker truck of the character described in claim 2 in which said means moving said carriage, boom, lift arms and winch are hydraulic means.

5. In a wrecker truck: a carriage; means tracking said carriage; a turntable pivotally attached to said carriage; a standard secured to said turntable; a boom pivotally attached to said standard; lift arms pivotally attached to said boom; pick up and securing means pivotally attached to said lift arms; a winch secured to said turntable; means moving said carriage along said means tracking said carriage; second means moving said turntable rotationally on said carriage; third means moving said boom rotationally to said standard; fourth means moving said lift arms rotationally to said boom; fifth means actuating said winch; and means controlling said means moving said carriage, turntable, boom, lift arms and winch.

6. A wrecker truck of the character described in claim 5 in which said standard consists of a plurality of elements secured on said turntable in spaced relation.

7. A wrecker truck of the character described in claim 5 in which said boom consists of a plurality of elements pivotally attached to said standard in spaced relation.

8. A wrecker truck of the character described in claim 5 in which said means moving said carriage, turntable, boom, lift arms and winch are hydraulic means.

9. In a wrecker truck: a carriage having lipped sides; means tracking said carriage and engaging with said lipped sides thereof; a turntable pivotally attached to said carriage; standards secured on said turntable in spaced relationship; a boom pivotally attached between said standards near the upper ends thereof; lift arms pivotally attached to the end of said boom opposite said standards; pick up and securing means pivotally attached to said lift arms; a winch secured to said turntable; double-acting hydraulic cylinders secured to the lower surface of said turntable, moving said turntable forwardly and rearwardly on said tracking means; another double-acting hydraulic cylinder pivotally secured at one end to said carriage and at the other end to said turntable, moving said turntable rotationally on said carriage; a third pair of double-acting hydraulic cylinders pivotally attached at one end to said boom arm and at the other end to said lift arms, moving said lift arms rotationally vertical to said boom; a fourth pair of double-acting hydraulic cylinders pivotally attached at one end to said standards and at the other end to said boom arm, moving said boom arm upwardly

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and downwardly; an oil motor engaging with and actuating said winch; a source of hydraulic fluid; means for pressurizing said hydraulic fluid; a plurality of controls connected between said source of hydraulic fluid and said double-acting hydraulic cylinders attached to said carriage, turntable, boom, and lift arms and said oil motor, thereby controlling the movements of said carriage, turntable, boom, lift arms and winch; and bearing means positioned between the carriage and said carriage tracking means and between said carriage and said turntable.

10. A wrecker truck of the character described in claim 1 in which said carriage is provided with lipped sides complementary to said means tracking said carriage and with a concentric, arcuate slot therethrough; in which said turntable is provided with a depending pin complementary to and extending through said arcuate slot in said carriage; and in which said second means moving said turntable is a double-acting hydraulic cylinder below said carriage pivotally connected at one end to said depending pin and at the other end to said carriage.

11. A wrecker truck of the character described in claim 5 in which said means moving said turntable consists of a motor geared to said turntable.

12. A wrecker truck of the character described in claim 5 in which said means moving said turntable consists of a motor on said turntable geared to said carriage.

13. In a wrecker truck: a turntable pivotally attached to a wrecker truck; a boom; means pivotally attaching said boom to said turntable; lift arms pivotally attached near one end of said boom; pick up and securing means pivotally attached to said lift arms; a hydraulic cylinder rotationally moving said turntable clockwise and counterclockwise; a second hydraulic cylinder moving said lift arms rotationally to said boom; a third means moving said boom rotationally to said turntable; and means controlling each of said means moving said turntable, boom and lift arms.

14. In a wrecker truck: a turntable pivotally attached to a wrecker truck; a boom; means pivotally attaching said boom to said turntable; lift arms pivotally attached near one end of said boom; pick up and securing means pivotally attached to said lift arms; means moving said turntable consisting of teeth on the peripheral edge of said turntable, a complementary driving gear engaged with said turntable teeth and connected to a motor means, rotationally moving said turntable clockwise and counterclockwise; a hydraulic cylinder moving said lift arms rotationally to said boom; a third means moving said boom rotationally to said turntable; and means controlling each of said means moving said turntable, boom and lift arms.

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