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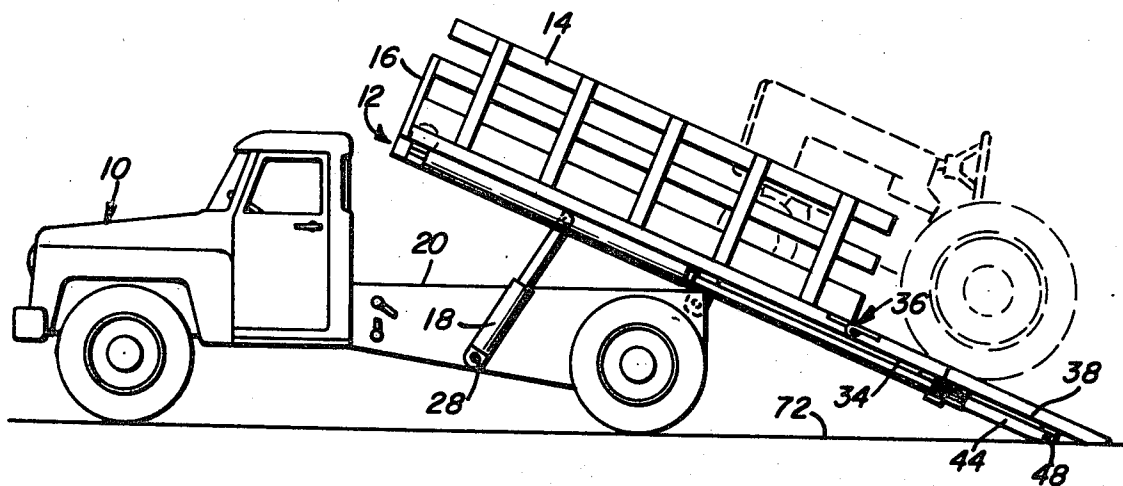
[54] **EXTENDABLE AND TILTABLE LOAD BED STRUCTURE**
9 Claims, 11 Drawing Figs.

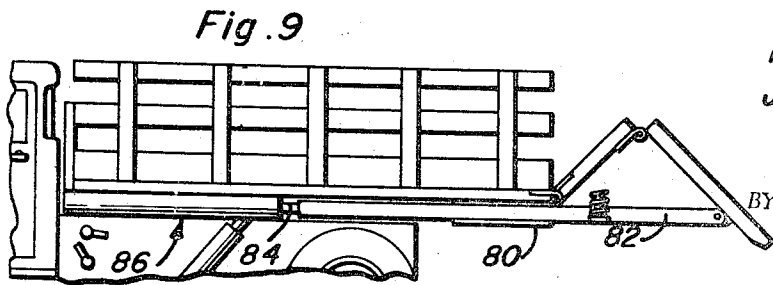
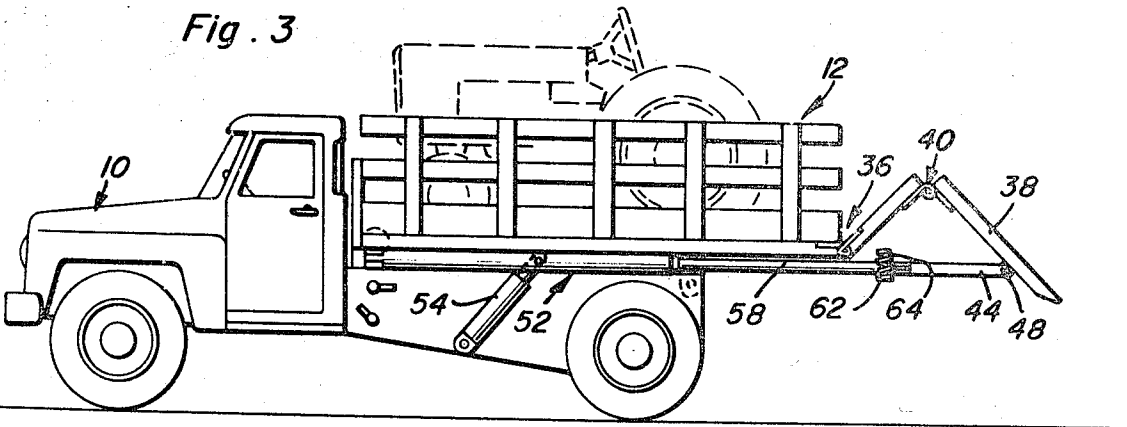
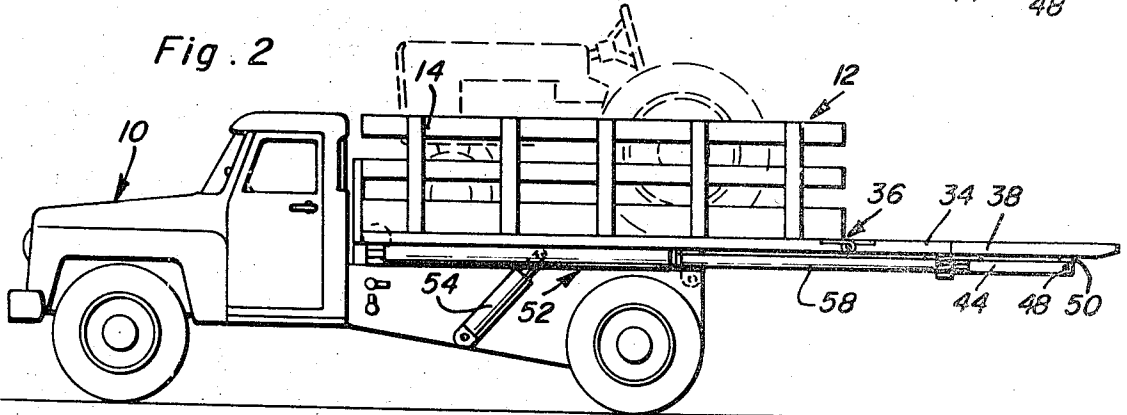
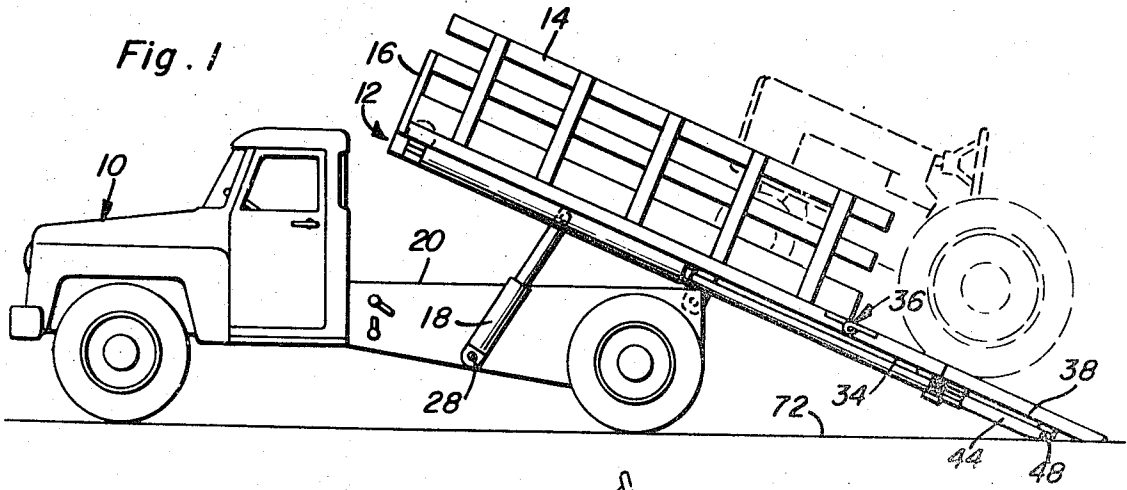
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 [51] Int. Cl. **B60p 1/04**
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 214/505, 85; 160/188

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ABSTRACT: A load bed assembly including a rear marginal edge and a first tailgate member pivotally supported therefrom for swinging between a first upstanding position and a second rearwardly projecting generally horizontally disposed position. The assembly further includes second gate member pivotally supported from the free marginal edge portion of the first member for swinging relative to the first member between a first position generally paralleling and disposed behind the first member and a second position generally coplanar with and forming an outward extension of the free edge portion of the first member. Also, the assembly includes actuator structure operative to support the second member in its first position when the first member is in its second position and to support the second member in either its first or second position when the first member is in its first position.





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Fig. 4

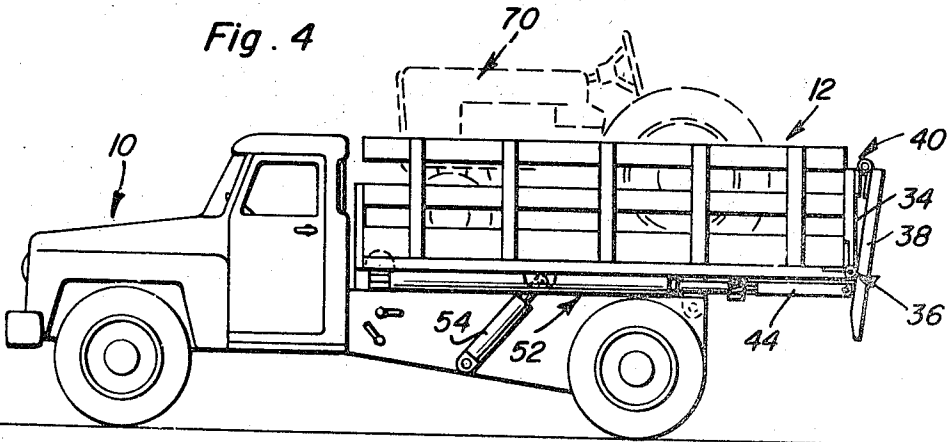


Fig. 5

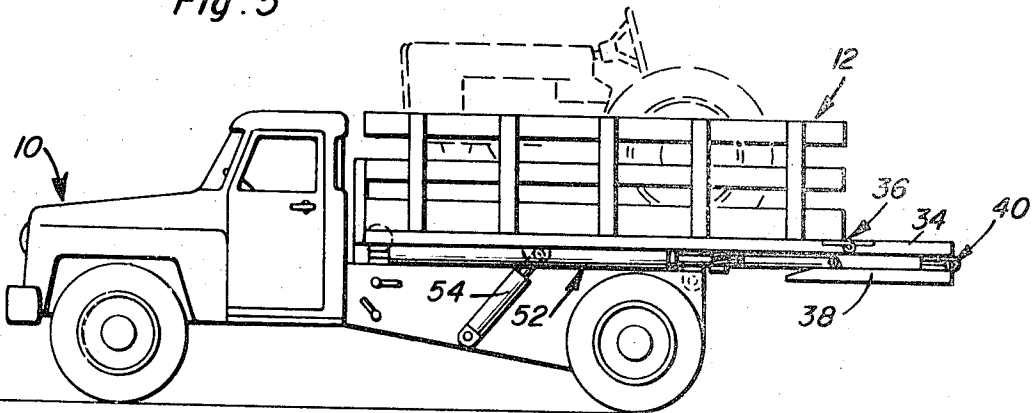
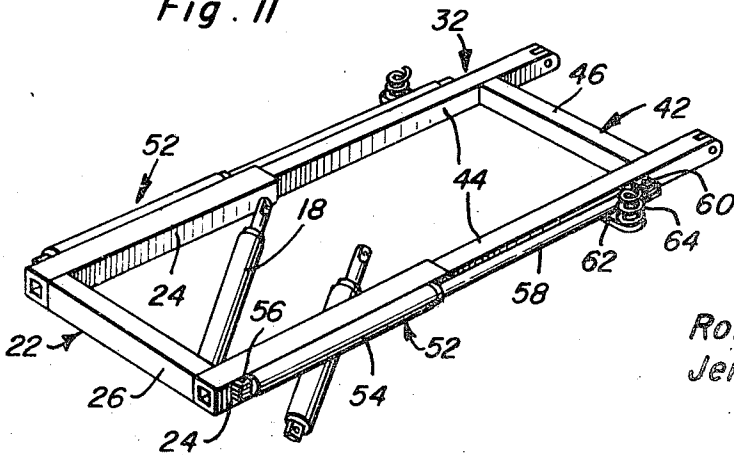
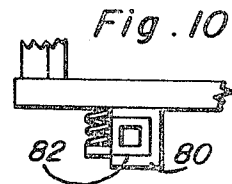
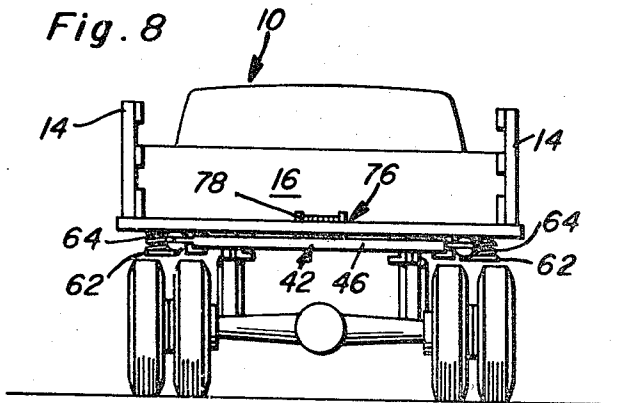
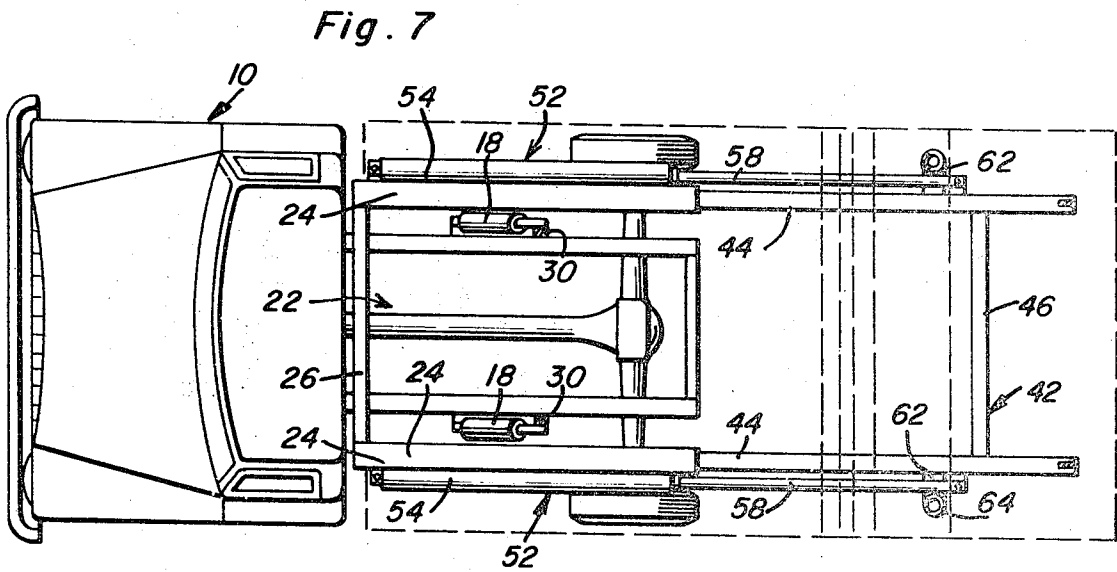
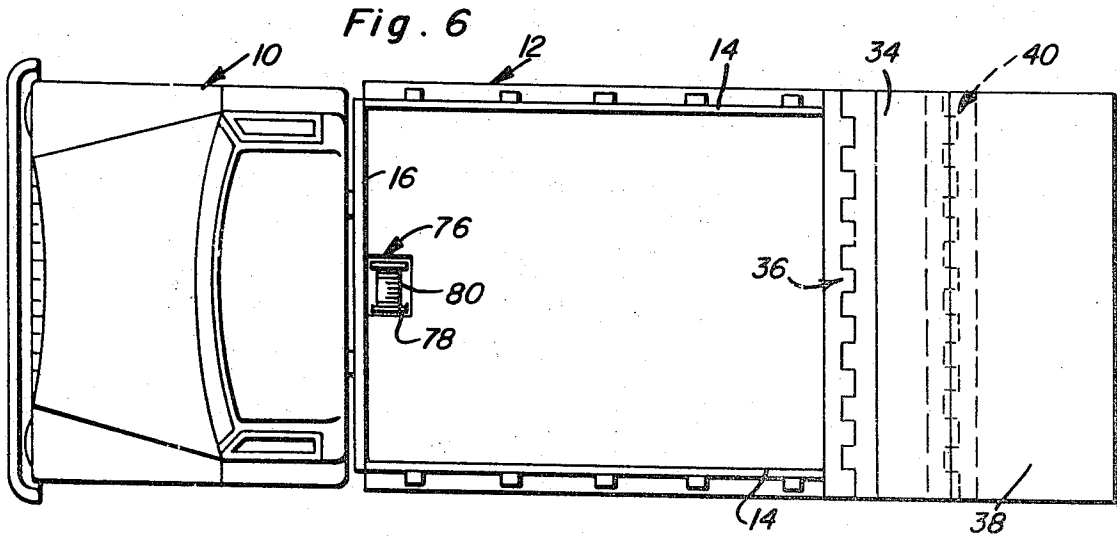


Fig. 11



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EXTENDABLE AND TILTABLE LOAD BED STRUCTURE

The main object of this invention is to provide an end gate structure for the tiltable load bed of a truck which may be shifted from an upstanding end gate forming position to an extended horizontally disposed position forming a loading and unloading ramp for the load bed when the latter is in a rearwardly and downwardly inclined position.

Another object of this invention is to provide an end gate structure in accordance with the preceding object and which may be readily attached to substantially all types of tiltable load bed structures.

Still another object of this invention is to provide an end gate structure that may be attached to the rear end of any load bed, either stationary or of the tiltable type, and shifted between a conventional upstanding end gate forming position and a horizontally disposed rearwardly projecting load bed extension forming position.

A further object of this invention is to provide an end gate structure including actuating control means therefor operable to shift the end gate structure components between their various relative positions and including only two actuating components which need be shifted only in a straight line path extending longitudinally of the associated load bed in order to shift the end gate structure between its three basic positions.

A final object of this invention to be specifically enumerated herein is to provide an end gate structure in accordance with the preceding objects which will conform to conventional forms of manufacture, be of simple construction and easy to use so as to provide a device that will be economically feasible, long lasting and relatively trouble-free in operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a side elevational view of a conventional form of vehicle provided with a tiltable load bed and with the end gate structure of the instant invention operatively associated with the load bed, the load bed being illustrating in an inclined position and the end gate structure being illustrated in fully extended position;

FIG. 2 is a side elevational view similar to FIG. 1 but with the tiltable load bed in a horizontal position;

FIG. 3 is a side elevational view similar to FIG. 2 but with the end gate structure in an intermediate position between the fully extended position and the end gate defining position;

FIG. 4 is a side elevational view similar to FIG. 3 but with the end gate structure in the full end gate defining position;

FIG. 5 is a side elevational view similar to FIG. 4 but with the end gate structure in a position forming an abbreviated rearward extension of the load bed;

FIG. 6 is a top plan view of the assemblage illustrated in FIG. 2;

FIG. 7 is a top plan view similar to FIG. 6 but with the load bed and end gate members of the end gate structure removed and illustrated in phantom lines;

FIG. 8 is a rear elevational view of the assemblage illustrated in FIG. 2;

FIG. 9 is a fragmentary side elevational view similar to FIG. 3 but illustrating a slightly modified form of end gate actuating structure;

FIG. 10 is a fragmentary enlarged rear elevational view illustrating the left hand portion of FIG. 8 on a larger scale; and

FIG. 11 is a fragmentary perspective view illustrating the end gate actuating structure and the relative position of the load bed tilting cylinders.

Referring now more specifically to the drawings the numeral 10 generally designates a truck type vehicle including a pivoted load bed assembly referred to in general by the reference numeral 12. The load bed assembly includes opposite side walls 14 interconnected at their forward ends by

means of a transversely extending forward wall 16 and a pair of extendable fluid motors 18 are connected between the frame 20 of the vehicle 10 and the load bed assembly 12 for tilting the load bed 12 from a horizontal position such as those illustrated in FIGS. 2 and 3 of the drawings to a rearwardly and downwardly inclined position such as that illustrated in FIG. 1.

With reference now more specifically to FIG. 9 of the drawings it may be seen that the load bed assembly 12 includes a frame referred to in general by the reference numeral 22 consisting of a pair of longitudinal members 24 interconnected at their forward ends by means of a forward transverse member 26. The longitudinal members 24 are tubular in configuration and the frame 22 may be a portion of the original load bed assembly 12 or a component of the end gate and load bed extending structure of the instant invention.

The lower ends of the fluid motors 18 are pivotally supported from the frame 12 by means of pivot fasteners 28 and the upper ends of the fluid motors 18 are pivotally secured to depending mounting portions 30 supported from the load bed assembly 12, see FIG. 7.

The end gate and load bed extending structure of the instant invention is generally referred to by the reference numeral 32 and includes a first end gate member 34 pivotally secured along one longitudinal edge portion to the rear marginal edge portion of the load bed assembly 12 by means of a piano-type hinge assembly referred to in general by the reference numeral 36. The structure 32 also includes a second end gate member 38 having a first marginal edge portion thereof pivotally secured to the second or free longitudinal edge portion of the first end gate member 34 by means of a second piano-type hinge assembly referred to in general by the reference numeral 40.

The structure 32 also includes an actuating frame referred to in general by the reference numeral 42 and including a pair of longitudinal members 44 interconnected at their rear ends by means of a transverse member 46. The forward ends of the longitudinal members 44 are telescopingly and slidingly received in the rear ends of the longitudinal members 24 and the rear ends of the longitudinal members 44 are pivotally secured to opposite end marginal edge portions of the second end gate member 38 by means of pivot fasteners 48 secured through the longitudinal members 44 and outstanding brackets 50 carried by the end gate member 38.

A pair of extendable fluid motors generally referred to by the reference numerals 52 have the base ends of their cylinder portions 54 secured to the forward ends of the longitudinal members 24 as at 56 and the free ends of the piston rod portions 58 of the fluid motors 52 are secured to the rear ends of the longitudinal members 44 as at 60. In addition, each of the longitudinal members 44 includes an outwardly projecting mounting flange 62 at its rear end upon which an upstanding coil spring 64 is mounted. The upper ends of the coil springs 64 are disposed for engagement with the opposite ends of the free marginal edge portion of the first end gate member 34 when the first and second end gate members 34 and 38 are in the fully extended position thereof such as those illustrated in FIG. 2 of the drawings.

From FIG. 4 of the drawings it may be seen that the width of the second end gate member 38 from the hinge assembly 40 to the free swinging edge of the end gate member 38 is greater than the corresponding dimension of the first end gate member 34. It may also be seen from FIG. 4 of the drawings that the spacing of the brackets 50 from the hinge 40 is greater than the spacing between the hinge assemblies 36 and 40.

With attention now invited again to FIG. 4 of the drawings, it may be seen that the fluid motors 52 may be all but fully retracted so as to position both the end gate member 34 and the end gate member 38 in upstanding positions defining an end gate at the rear end of the load bed assembly 12. When it is desired to remove a load from the load bed 12 such as the load represented by the tractor 70, and the fluid motors 52 are extended so that the end gate members 34 and 38 are shifted

first to the position thereof illustrated in FIG. 3 of the drawings and then to the position thereof illustrated in FIG. 2 of the drawings. Thereafter, the fluid motors 18 may be extended so as to tilt the load bed assembly 12 from the position thereof illustrated in FIG. 2 of the drawings to the position thereof illustrated in FIG. 1 of the drawings whereby the free edge portion of the second end gate member 38 will contact the ground 72 upon which the vehicle 10 rests. Then, the tractor 70 may be driven or rolled rearwardly and downwardly along the load bed assembly 12 and the end gate members 34 and 38 to the ground 72. Of course, if it is desired to load the tractor 70 on the load bed 12, the above referred to steps are reversed. Further, if the tractor 70 is inoperative to climb the inclined load bed under its own power, the forward end of the load bed assembly 12 is provided with a winch assembly referred to in general by the reference numeral 76 including a powered winding drum 78 having a cable 80 thereon which may be attached to the tractor 70 and utilized to pull the tractor 70 up onto the load bed assembly 12.

In addition to the end gate members 34 and 38 being positionable in those positions thereof illustrated in FIGS. 1-4 of the drawings, if the fluid motors 52 are further retracted from the positions thereof illustrated in FIG. 4 of the drawings the end gate members 34 and 38 may be swung to the position thereof illustrated in FIG. 5 of the drawings with the end gate member 34 forming a short horizontal extension of the load bed assembly 12. Also, when it is desired to swing the end gate members 34 and 38 from the position thereof illustrated in FIGS. 1 and 2 of the drawings to either of the positions illustrated in FIGS. 3 and 4 of the drawings, the compression springs 64 are operable to upwardly deflect the adjacent edge portions of the end gate members 34 and 38 upon initial retraction of the fluid motors 52.

With attention now invited more specifically to FIGS. 10 and 11 of the drawings there may be seen a modified form of end gate and load bed extending structure which is substantially identical to the structure 32 except that a frame such as frame 22 is not utilized and a pair of longitudinally extending and outwardly opening channel members 80 are utilized to guidingly and slidingly engage longitudinal members 82 corresponding to longitudinal member 44 and which have their forward ends connected directly to the free ends of the piston rod portions 84 of fluid motors 86 utilized in lieu of fluid motors 52 and which are secured directly to the load bed assembly 12.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to falling within the scope of the invention.

We claim:

1. A generally horizontal load bed structure including a load bed member having remote marginal edge portions, a first extension and tail gate forming member including first and second remote marginal edge portions, first means pivotally securing said first edge portion to one of said load bed member edge portions for swinging of said first member between a first position upstanding from said one edge portion and a second position generally coplanar with and forming an outward extension of said one edge portion, a second extension and tail gate forming member including third and fourth remote edge portions, second means pivotally securing said third edge portion to said second edge portion for swinging of said second member relative to said first member between a first position depending downward from said second edge portion and juxtaposed relative to said first member when the latter is in said first position thereof and a second position forming an outward generally coplanar extension of said second edge portion when said first member is in said second position thereof, actuator structure operative to support the second extension in its first position when the first extension is

in its first position as well as in its first or second position when the first extension is in its second position, said actuating structure comprising support means guidingly projectable horizontally outwardly of said one load bed member edge portion and pivotally attached to the free marginal edge portion of said second extension, said support means remaining horizontal relative to the bed in all positions of the first and second tail gate forming members.

2. The combination of claim 1 wherein said first and second means also include means whereby said first member may also be swung to said second position thereof with said second member retained in said first position thereof relative to said first member in juxtaposition and beneath the latter.

3. The combination of claim 2 wherein said actuator means includes elongated parallel members longitudinally shiftable transversely of the axis of relative rotation of said first and second members in a plane generally paralleling the plane in which said first and second members are disposed when in said second position thereof.

4. A load bed structure including a load bed member having remote marginal edge portions, a first extension and tail gate forming member including first and second remote marginal edge portions, first means pivotally securing said first edge portion to one of said load bed member edge portions for swinging of said first member between a first position upstanding from said one edge portion and a second position generally coplanar with and forming an outward extension of said one edge portion, a second extension and tail gate forming member including third and fourth remote edge portions, second means pivotally securing said third edge portion to said second edge portion for swinging of said second member relative to said first member between a first position depending downward from said second edge portion and juxtaposed relative to said first member when the latter is in said first position thereof and a second position forming an outward generally coplanar extension of said second edge portion when said first member is in said second position thereof, said first and second means also including means whereby said first member may also be swung to said second position thereof with said second member retained in said first position thereof relative to said first member in juxtaposition and beneath the latter, actuator means for shifting said first and second members to said positions thereof, said actuator means including elongated parallel members longitudinally shiftable transversely of the axis of relative rotation of said first and second members in a plane generally paralleling the plane in which said first and second members are disposed when in said second positions thereof, said elongated parallel members including parallel bars including one pair of corresponding ends slidingly telescoped into parallel tubular guide sleeves supported from said load bed member.

5. The combination of claim 4 wherein said load bed member is pivotally supported from a vehicle frame for pivotal oscillation about a horizontal axis between positions with said load bed horizontally disposed and inclined and with said one edge portion of said load bed raised and lowered, respectively.

6. A load bed assembly including a rear marginal edge, a first tail gate member pivotally supported from said edge for swinging between a first upstanding position and a second rearwardly projecting generally horizontally disposed position, a second gate member pivotally supported from the free marginal edge portion of the first member for swinging relative to said first member between first position generally paralleling and disposed behind the first member and a second position generally coplanar with and forming an outward extension of the free-edge portion of the first member, the assembly also including actuator structure operative to support the second member in its first position when the first member is in its first position as well as in its first or second position when the first member is in its second position, said actuator structure comprising support means guidingly projectable horizontally outwardly of said rear marginal edge and pivotally attached to the free marginal edge portion of second tail gate

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member, said support means remaining horizontal relative to the bed in all positions of the first and second tail gate forming members.

7. A load bed assembly including a rear marginal edge, a first tail gate member pivotally supported from said edge for swinging between a first upstanding position and a second rearwardly projecting generally horizontally disposed position, a second gate member pivotally supported from the free marginal edge portion of the first member of swinging relative to said first member between first position generally paralleling and disposed behind the first member and a second position generally coplanar with and forming an outward extension of the free-edge portion of the first member, the assembly also including actuator structure operative to support the second member in its first position when the first member is in its first position as well as in its first or second position when

the first member is in its second position, said actuator structure comprising a pair of opposite side longitudinally extending members supported from said load bed for guided longitudinal reciprocation, the rear ends of said longitudinally extending members being pivotally attached to the free ends of said second tail gate member.

8. The combination of claim 7 wherein the rear ends of said longitudinally extending members underlie and support the support side edge portions of said tail gate members when the latter are in their second positions.

9. The combination of claim 7 wherein said load bed assembly is pivotally supported from a vehicle frame for pivotal oscillation about a horizontal axis between positions with said load bed assembly horizontally disposed and inclined with said rear marginal edge raised and lowered, respectively.

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