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(54) **LIFT BAR FOR A SNOWPLOW MOUNTED ON THE FORWARD END OF A SNOWMOBILE**

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(57) **ABSTRACT**

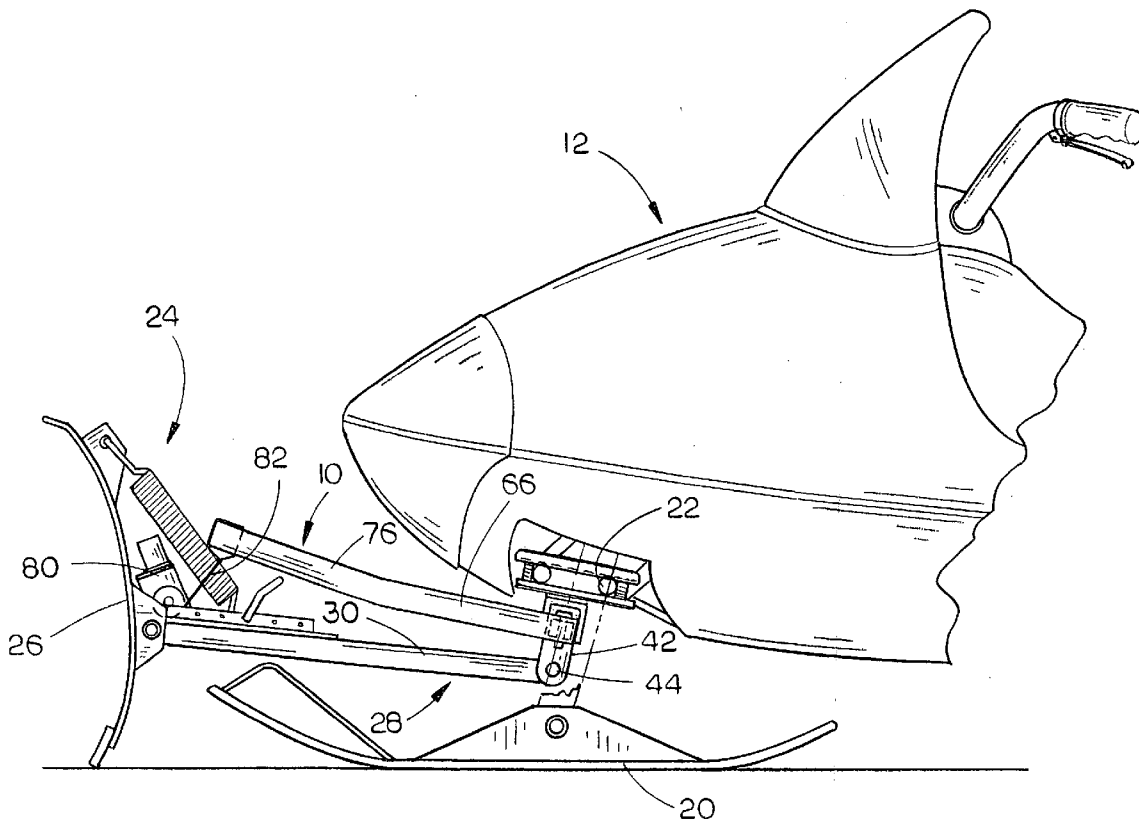
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A lift bar is disclosed for mounting on the forward end of an off-road vehicle such as a snowmobile, ATV, UTV, riding mower or garden tractor. The lift bar extends forwardly from the suspension of the vehicle and provides a way for tying off the winch or other actuator of the plow so that the plow may be raised and lowered relative to the vehicle.



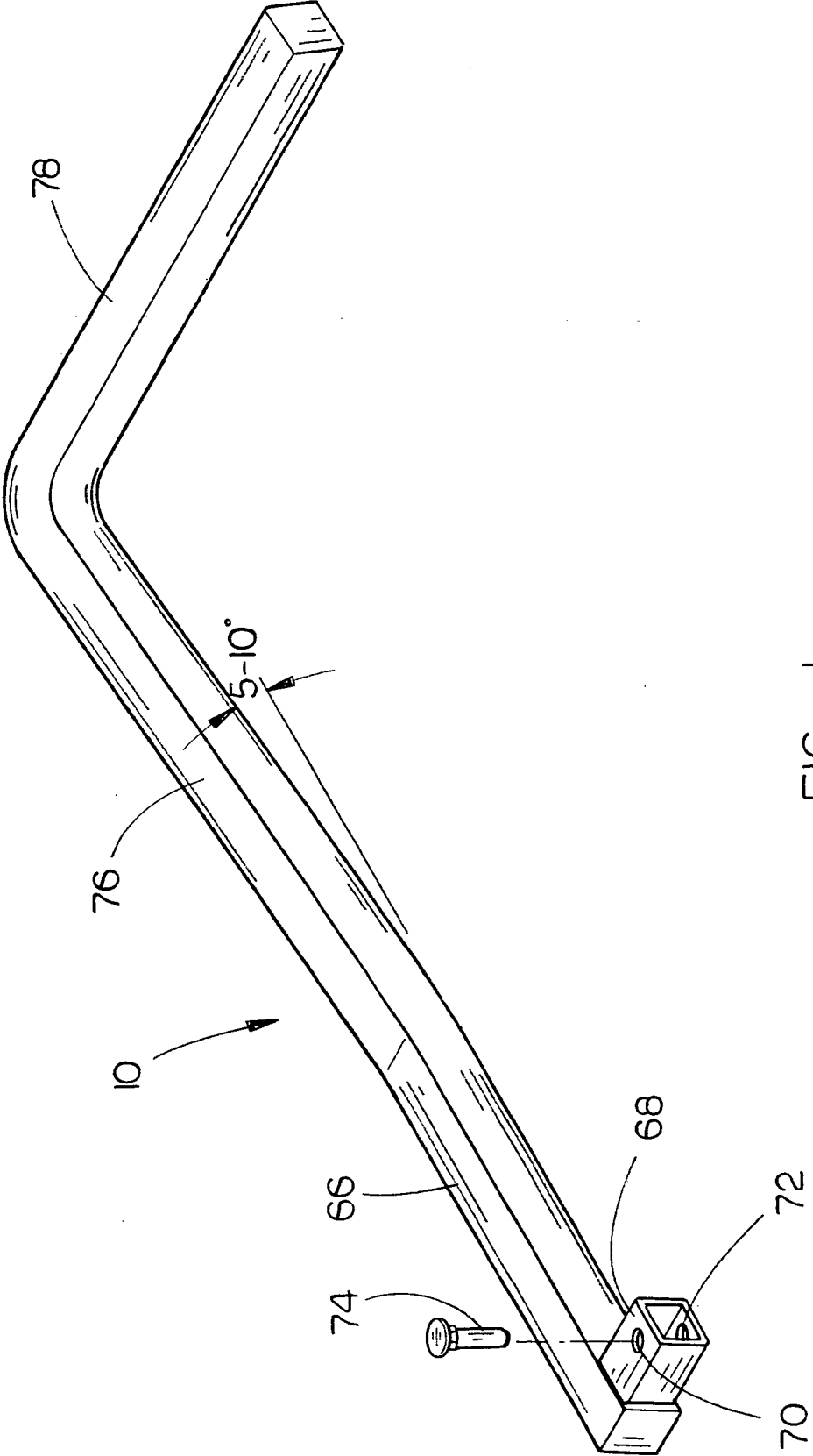


FIG. 1

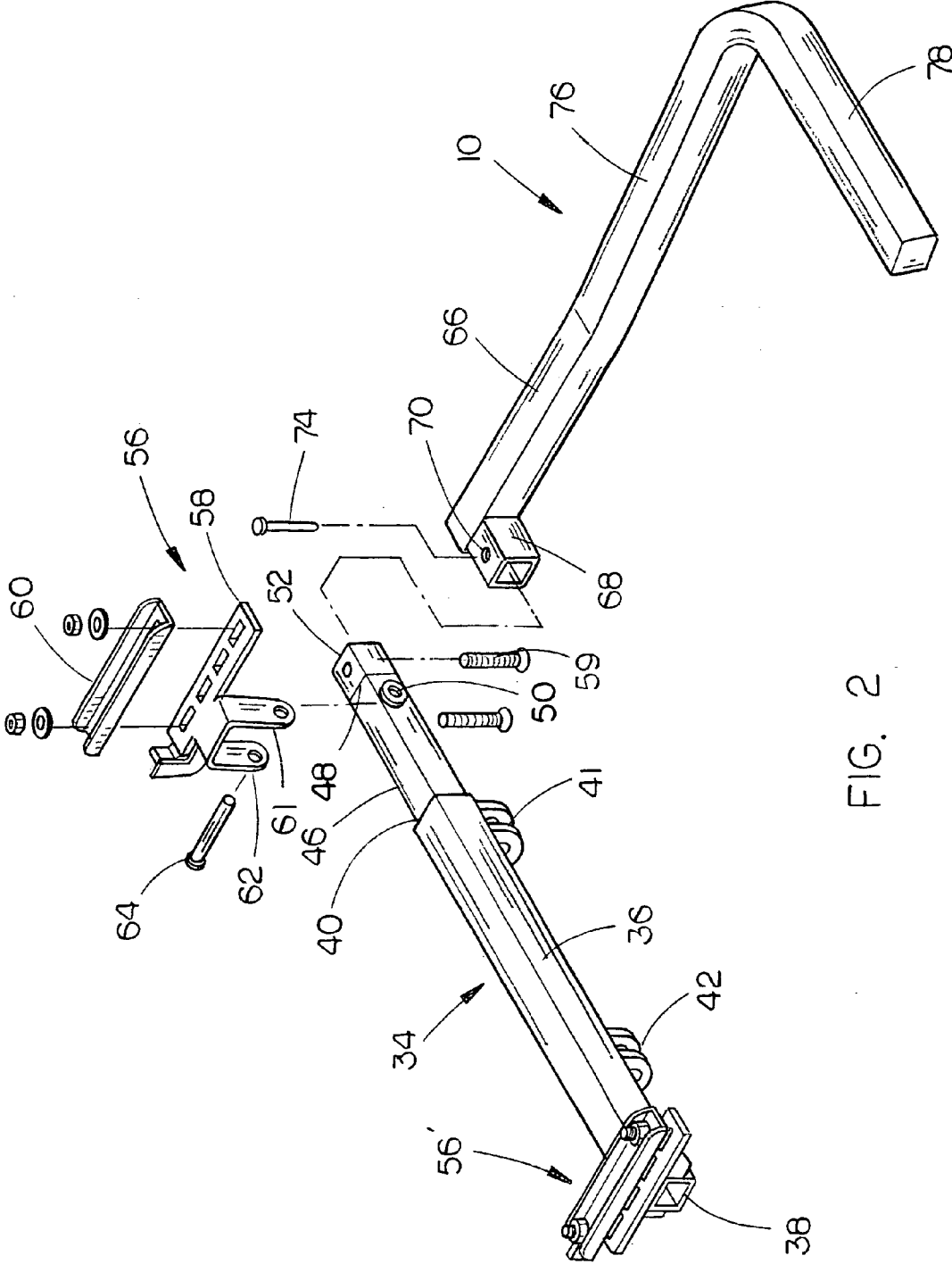


FIG. 2

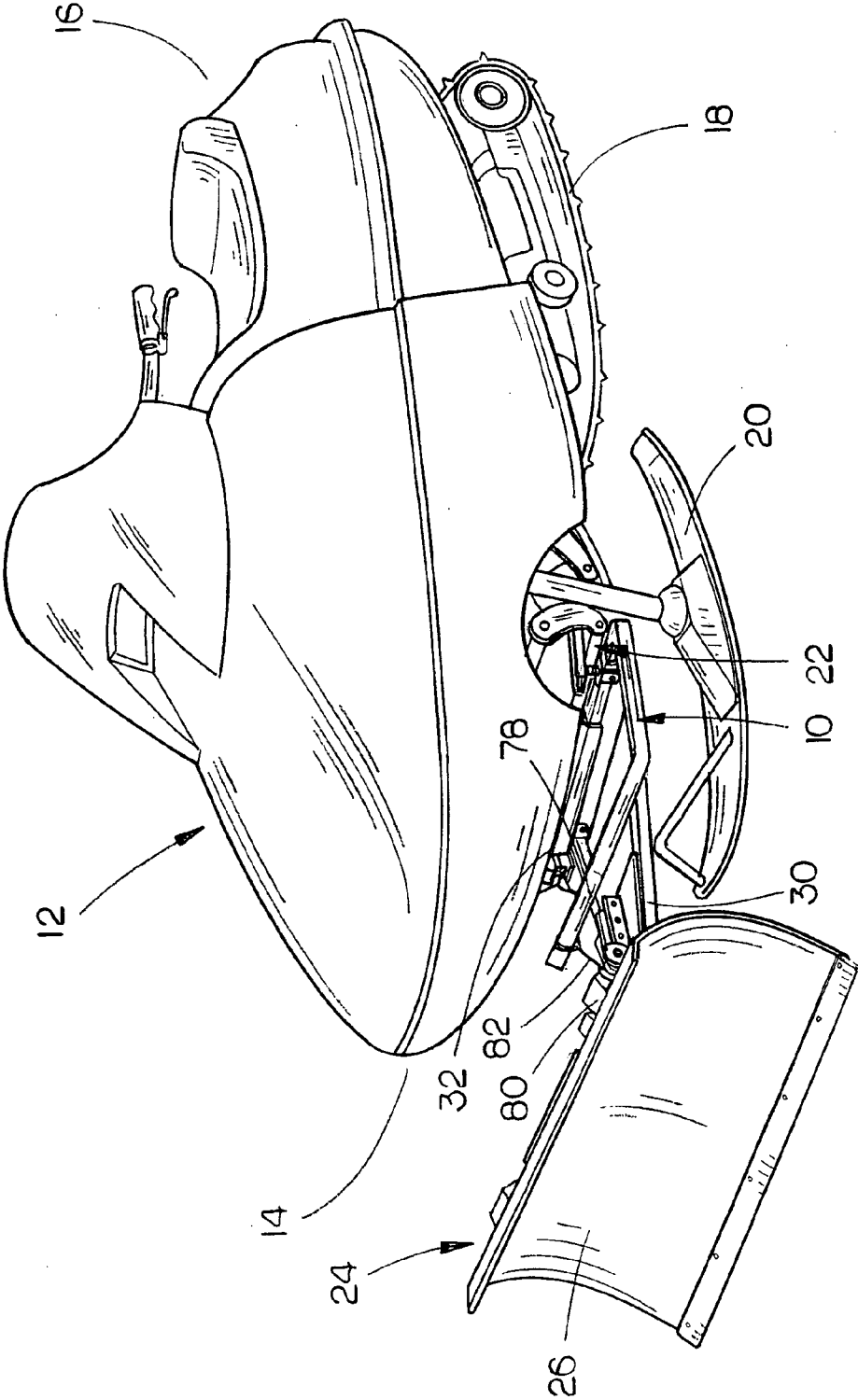


FIG. 3

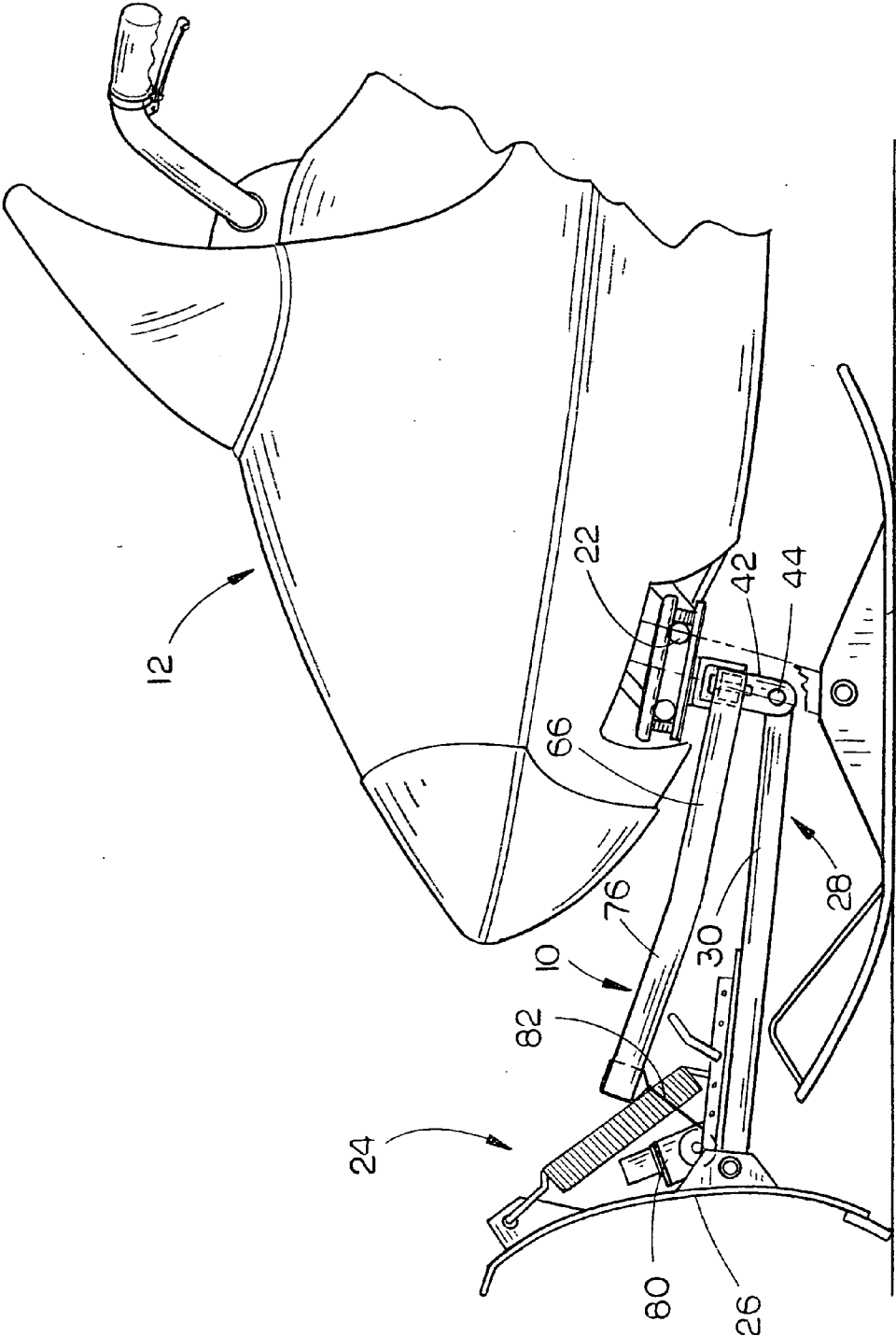


FIG. 4

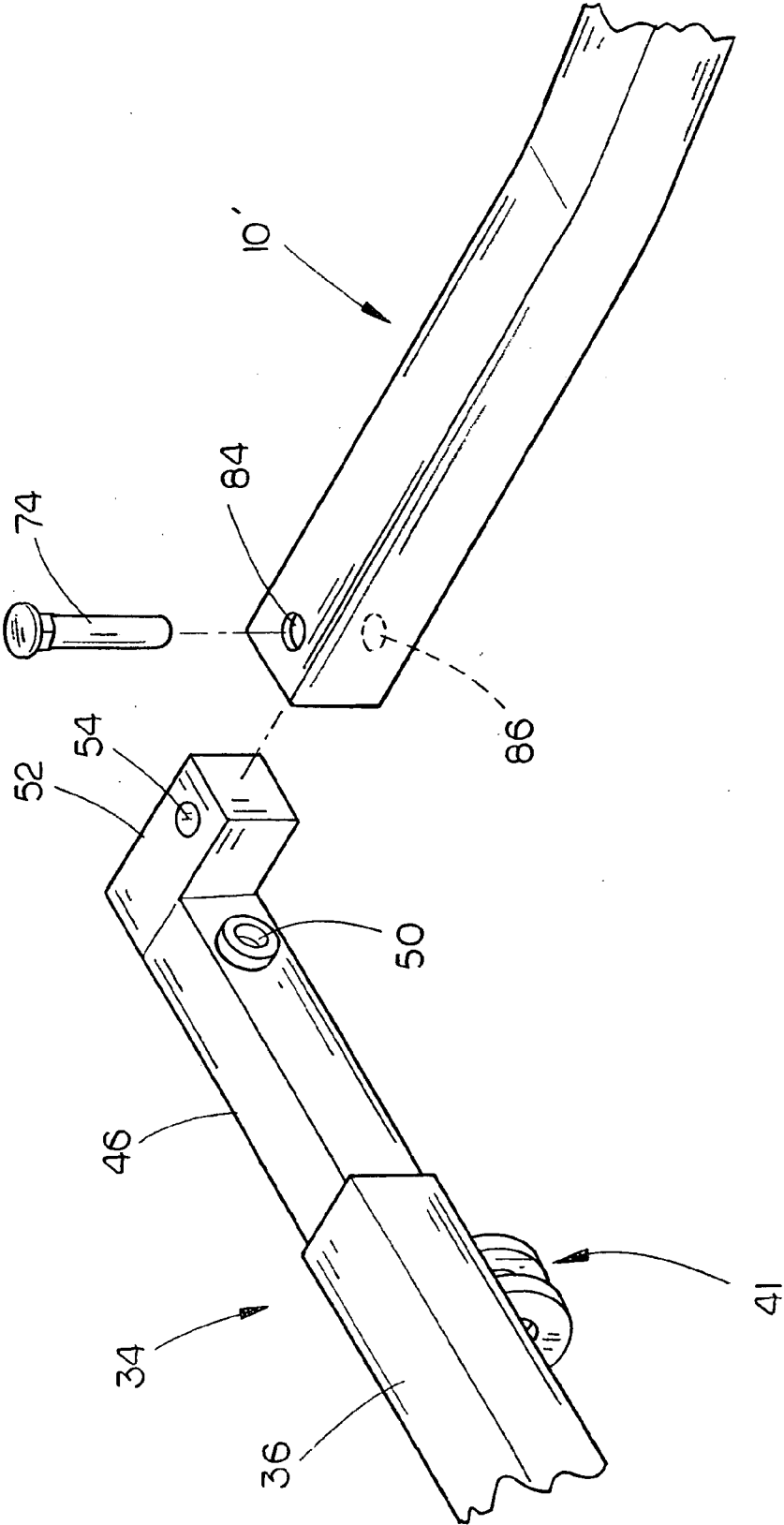


FIG. 5

**LIFT BAR FOR A SNOWPLOW MOUNTED
ON THE FORWARD END OF A
SNOWMOBILE**

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] This invention relates to a lift bar for a snowplow mounted on the forward end of a snowmobile and more particularly to a plow mounted on the forward end of an off-road vehicle such as an ATV, UTV, riding mower, garden tractor or the like.

[0003] 2. Description of the Related Art

[0004] Snowmobiles normally include a forward end, a rearward end, first and second steerable skis at the forward end thereof which are supported by first and second suspension systems respectively, and a track means at the rearward end thereof which drives the snowmobile in either a forward or rearward direction. To the best of Applicant's knowledge, no one has previously provided a snowplow which may be conveniently mounted on the forward end of the snowmobile and which may be raised and lowered with respect to the ground. Perhaps one of the reasons that snowplows have not been mounted on the forward end of a snowmobile in the past is that there is no place to tie-off or connect a winch cable to raise and lower the snowplow with respect to the snowmobile. The same is also true for an ATV or UTV which does not have a cargo rack on the forward end thereof to which the winch cable may be tied thereto to permit the blade to be raised and lowered with respect to the vehicle. In some cases, a manual actuation means has been provided for raising and lowering a plow blade with respect to an ATV without the use of a winch through the use of a lift handle such as described in U.S. Pat. No. 5,615,745.

SUMMARY OF THE INVENTION

[0005] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key aspects or essential aspects of the claimed subject matter. Moreover, this Summary is not intended for use as an aid in determining the scope of the claimed subject matter.

[0006] A lift bar is provided for a plow for use at the forward end of an off-road vehicle such as a snowmobile, ATV, UTV, riding mower, or garden tractor. The vehicle has a forward end, a rearward end, and first and second steerable skis or wheels at the forward end thereof which are supported by first and second suspension systems respectively. Normally, the suspension systems will be of the A-arm type. An elongated, transversely extending telescopic support member, having first and second ends, is selectively removably secured to the first and second suspension systems of the vehicle respectively so as to extend therebetween. A plow blade assembly including a blade with a push tube assembly extending rearwardly therefrom is pivotally secured to the telescopic support member about a horizontal axis. The plow blade assembly has a winch mounted thereon which has a winch cable extending therefrom. A lift bar, having rearward and forward ends, is secured to the telescopic support member and extends therefrom towards the blade. The winch cable is secured to the lift bar so that the winch may be operated to raise the plow blade with respect to the vehicle and the ground.

[0007] A principal object of the invention is to provide a lift bar for a plow mounted on the forward end of a snowmobile.

[0008] A further object of the invention is to provide a lift bar for a plow mounted on the forward end of an off-road vehicle such as a snowmobile, ATV, UTV, riding mower or garden tractor.

[0009] A further object of the invention is to provide a lift bar of the type described which is selectively removably secured to the vehicle.

[0010] A further object of the invention is to provide a lift bar for a plow mounted on the forward end of a snowmobile with the lift bar being designed so that a winch mounted on the plow may have the winch cable thereof connected to the lift bar so that the plow may be raised with respect to the vehicle by operating the winch.

[0011] A further object of the invention is to provide a lift bar of the type described which does not interfere with the normal operation of the vehicle.

[0012] A further object of the invention is to provide a lift bar for a plow mounted on the forward end of a snowmobile which enables the hood of the snowmobile to be opened and closed without interference from the lift bar.

[0013] These and other objects will be apparent to those skilled in the art.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] Non-limiting and non-exhaustive embodiments of the present invention are described with reference to the following figures, wherein like reference numerals refer to like parts throughout the various views unless otherwise specified.

[0015] FIG. 1 is a perspective view of a lift bar of this invention;

[0016] FIG. 2 is a perspective view of the lift bar of this invention with the mounting structure to which it is attached being shown in the partially exploded view;

[0017] FIG. 3 is a front perspective view of a snowmobile having a plow mounted on the forward end thereof utilizing the structure of FIG. 2 with a portion of the snowmobile cutaway to more fully illustrate the invention;

[0018] FIG. 4 is a partial side elevational view of the snowmobile having the blade structure mounted thereon utilizing the structure of FIG. 2; and

[0019] FIG. 5 is a partial perspective view of an alternate means for securing the lift bar to the mounting structure.

DESCRIPTION OF THE PREFERRED
EMBODIMENT

[0020] Embodiments are described more fully below with reference to the accompanying figures, which form a part hereof and show, by way of illustration, specific exemplary embodiments. These embodiments are disclosed in sufficient detail to enable those skilled in the art to practice the invention. However, embodiments may be implemented in many different forms and should not be construed as being limited to the embodiments set forth herein. The following detailed description is, therefore, not to be taken in a limiting sense in that the scope of the present invention is defined only by the appended claims.

[0021] The lift bar of this invention is referred to generally by the reference numeral **10** and is primarily designed to be used with a snowmobile **12** but which may be used with other off-road vehicles such as ATV's, UTV's, riding mowers and

garden tractors. The lift bar 10 is especially useful for use with those off-road vehicles which do not have a cargo rack or other structure at the forward end thereof to which the winch cable, which is used to raise and lower a plow mounted at the forward end of the vehicle, may be "tied-off."

[0022] Snowmobile 12 includes a forward end 14, rearward end 16, a driven track 18 for propelling the snowmobile, a pair of steerable skis 20 at the forward end of the snowmobile 12, each of which are supported by a suspension system 22 which is normally of the A-arm type.

[0023] The numeral 24 refers to a plow blade assembly including a plow blade 26 having a push tube assembly 28 extending rearwardly therefrom which includes push tubes 30 and 32.

[0024] The numeral 34 refers to a mounting structure generally similar to that described in the pending patent application owned by the assignee of this invention which is entitled "UNIVERSAL BLADE MOUNTING SYSTEM FOR AN ALL TERRAIN VEHICLE," Ser. No. 11/593,211, filed Nov. 6, 2006, the disclosure of which is incorporated herein by reference.

[0025] Mounting structure 34 includes a first elongated hollow tube 36 having an outer end 38, an inner end 40 and brackets 40 and 42 which are secured to tube 36 by welding or the like and which are adapted to receive shear pins 44 therein. The numeral 46 refers to an elongated tube having an outer end 48 and an inner end which is received in a slidable fashion within tube 36. The outer end of tube 48 is provided with an opening 50 formed therein. The outer end of tube 36 is also provided with an opening similar to opening 50. The outer end 48 of tube 46 has a stub 52 welded thereto having a vertically disposed opening 54 formed therein. In some cases, the tube 46 could have a length sufficient so that the outer end thereof extends sufficiently beyond the opening 50 without the necessity of having a stub 52 welded thereto.

[0026] The numeral 56 refers to a clamp assembly which includes a lower clamp portion 58 and an upper clamp portion 60 which may be secured together on the associated suspension system 22 by bolts 59. Lower clamp portion 58 has a pair of spaced-apart legs 61 and 62 extending downwardly therefrom which are adapted to receive a pin 64 therein. The legs 61 and 62 are pivotally mounted to the tube 46 by means of the pin 64 extending through the opening in leg 62, opening 50 in tube 46 and the opening in leg 61. The pin 64 is maintained in position by any suitable means. The clamp portions 58 and 60 are clamped onto the suspension 22 at the left side of the snowmobile 12. Clamp assembly 56' is clamped onto the suspension 22 at the right side of the snowmobile. The slidable positioning of the tube 46 within the tube 36 enables the suspension systems 22 at the forward end of the snowmobile to move upwardly and downwardly to function in their intended way.

[0027] Lift bar 10 includes a rearward end portion 66 having a stub 68 welded thereto and which extends transversely therefrom, as seen in FIGS. 1 and 2. Stub 68 is provided with openings 70 and 72 formed therein adapted to receive a pin or bolt 74. The forward end of rearward end portion 66 of lift bar 10 terminates in a forwardly extending tube portion 76 which is preferably bent upwardly with respect to portion 66 at approximately 5-10° to provide additional clearance at the forward end of the lift bar 10. Lift bar 10 includes a transversely extending forward end portion 78 which extends therefrom, as seen in FIGS. 1 and 2. Stub 68 is selectively slidably mounted on stub 52 and secured thereto by means of

the pin 74 extending through opening 70, opening 54 in stub 52 and through opening 72 in stub 68. As seen in the drawings, the lift bar 10 extends forwardly from its rearward end and then extends across a portion of the forward end of the snowmobile 12.

[0028] A winch 80 is mounted on the plow blade assembly 24 in conventional fashion and has a winch cable 82 extending therefrom which is preferably looped over the transversely extending forward end portion 78 of lift bar 10. The rearward ends of the push tubes 30 and 32 are pivotally connected to the brackets 40 and 42 so that the blade 26 may be moved upwardly and downwardly with respect to the ground and the snowmobile.

[0029] Thus, with the blade 26 resting on the ground, as illustrated in FIG. 4, actuation of the winch 80 will cause the blade 26 to be raised from the ground upwardly towards the forward end portion 78 of lift bar 10. When it is desired to lower the blade 26 from its raised position, the winch 80 may be deactivated and if the winch 80 does not include a brake, the weight of the plow blade assembly will cause the blade 26 to lower and enter into engagement with the ground. If the winch 80 includes a conventional brake, the winch is reversed so that the cable 82 will play outwardly from the winch 80 to cause the blade 26 to lower to the ground. Although a winch 80 is disclosed, a screw actuator or other type of mechanism could be used to interconnect the plow assembly with the lift bar 10 to cause the blade 26 to be raised and lowered. Although the drawings illustrate that the winch 80 is mounted on the plow blade assembly and the winch cable is secured to the lift bar 10, the winch 80 could be mounted on the lift bar 10 with the winch cable secured to the plow blade assembly.

[0030] Thus it can be seen that a novel lift bar has been provided which enables a snowmobile to have a plow blade assembly 24 selectively removably positioned at the forward end thereof. The blade and its mounting structure are easily removable from the snowmobile when the plow is not being used.

[0031] The lift bar 10 of this invention also provides a way for raising and lowering the blade of the plow assembly secured to the forward end of an ATV, UTV, riding mower or garden tractor which does not have any means of tying off the winch cable of the blade assembly. FIG. 5 illustrates an alternate means for selectively removably securing a lift bar 10' to the end of the tube 46 of the mounting structure 34. As seen in FIG. 5, the stub 52 is welded to the end of tube 46 so as to extend forwardly therefrom at a right angle. The inner end of lift bar 10' is sized so as to be able to slip over the stub 52 so that the openings 84 and 86 formed in the end of lift bar 10' register with opening 54 in stub 52 to enable the pin 74 to be extended therethrough.

[0032] It can therefore be seen that the invention accomplishes at least all of its stated objectives.

[0033] Although the invention has been described in language that is specific to certain structures and methodological steps, it is to be understood that the invention defined in the appended claims is not necessarily limited to the specific structures and/or steps described. Rather, the specific aspects and steps are described as forms of implementing the claimed invention. Since many embodiments of the invention can be practiced without departing from the spirit and scope of the invention, the invention resides in the claims hereinafter appended.

1. In combination with a snowmobile having a forward end, a rearward end, and first and second steerable skis at the

forward end thereof which are supported by first and second suspension systems respectively:

an elongated, transversely extending telescopic support member having first and second ends which are selectively removably secured to the first and second suspension systems of the snowmobile respectively so as to extend therebetween;

a plow blade assembly including a blade with a push tube assembly extending rearwardly therefrom which is pivotally secured to said telescopic support member about a horizontal axis;

said plow blade assembly having a winch mounted thereon which has a winch cable extending therefrom;

a lift bar, having rearward and forward ends, secured to said telescopic support member and extending therefrom towards said blade;

said winch cable being secured to said lift bar whereby said winch may be operated to raise said plow blade with respect to the snowmobile and the ground.

2. The combination of claim 1 wherein said telescopic support member comprises a telescopic tube means.

3. The combination of claim 1 wherein said lift bar is secured to one of said first and second ends of said telescopic support member.

4. The combination of claim 1 wherein said lift bar is selectively removably secured to said telescopic support member.

5. The combination of claim 3 wherein said lift bar is selectively removably secured to said one end of said telescopic support member.

6. The combination of claim 1 wherein said lift bar has a transversely extending forward end portion.

7. The combination of claim 1 wherein said forward end of said lift bar dwells in a plane above its said rearward end.

8. The combination of claim 1 wherein an outwardly extending stub is secured to one end of said telescopic support member and wherein said lift bar has a transversely extending stub which is selectively secured to said outwardly extending stub.

9. The combination of claim 1 wherein a forwardly extending stub is secured to one end of said telescopic support member and wherein the rearward end of said lift bar is secured to said forwardly extending stub.

10. The combination of claim 8 wherein said lift bar includes a longitudinally extending portion having a rearward end secured to the said stub on said telescopic support member and wherein said lift bar includes a transversely extending forward end portion which extends from the forward end of said longitudinally extending portion.

11. The combination of claim 10 wherein said winch cable is secured to said transversely extending forward end portion of said lift bar.

12. The combination of claim 8 wherein the forward end of said longitudinally extending portion dwells in a plane above the rearward end thereof.

13. In combination with an off-road vehicle, having a forward end, a rearward end, and first and second steerable wheels at the forward end thereof which are supported by first and second suspension systems respectively:

an elongated, transversely extending telescopic support member having first and second ends which are selectively removably secured to the first and second suspension systems of the vehicle respectively so as to extend therebetween;

a plow blade assembly including a blade with a push tube assembly extending rearwardly therefrom which is pivotally secured to said telescopic support member about a horizontal axis;

a lift bar, having rearward and forward ends, secured to said telescopic support member and extending therefrom towards said blade;

a winch having a winch cable extending therefrom; said winch being secured to one of said plow blade assembly or said lift bar;

said winch cable being secured to the other of said plow blade assembly and said lift bar;

said winch being selectively operable to raise said plow blade with respect to the vehicle and the ground.

14. The combination of claim 13 wherein said telescopic support member comprises a telescopic tube means.

15. The combination of claim 13 wherein said lift bar is secured to one of said first and second ends of said telescopic support member.

16. The combination of claim 13 wherein said lift bar is selectively removably secured to said one end of said telescopic support member.

17. The combination of claim 13 wherein said lift bar has a transversely extending forward end portion.

18. The combination of claim 13 wherein said forward end of said lift bar dwells in a plane above its said rearward end.

19. The combination of claim 13 wherein an outwardly extending stub is secured to one end of said telescopic support member and wherein said lift bar has a transversely extending stub which is selectively secured to said stub which is secured to said telescopic support member.

20. The combination of claim 13 wherein a forwardly extending stub is secured to one end of said telescopic support member and wherein the rearward end of said lift bar is secured to said forwardly extending stub.

21. The combination of claim 19 wherein said lift bar includes a longitudinally extending portion having a rearward end secured to the said outwardly extending stub and wherein said lift bar includes a transversely extending forward end portion which extends from the forward end of said longitudinally extending portion.

22. The combination of claim 19 wherein said winch is mounted on said plow blade assembly and said winch cable is secured to said transversely extending forward end portion of said lift bar.

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