

[54] **MOWING DEVICE**
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[52] **U.S. Cl.**..... **56/15.3, 56/16.2, 56/209,**
180/66 R, 180/79.2 C, 192/129 R, 280/6 R
[51] **Int. Cl.**..... **A01d 35/28**
[58] **Field of Search**..... **56/209, 6, 10.9,**
56/11.1, 15.3, 15.4, 15.7, 15.8, 16.2; 280/6;
180/79.2, 66; 192/129

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[57] **ABSTRACT**
My invention pertains to a mowing device that can easily and continuously operate on slopes as great as 40 degrees without danger of overturning. My mowing device comprises a wheel supported framework and a cradle section supported by said framework so that the cradle section can swing through at least a limited arc with respect to its supporting framework as the mower unit moves from level to sloping ground, to thus maintain the cradle section in an essentially level attitude at all times. The invention also includes other novel features useful on a mowing device, including steering mechanism, etc.

19 Claims, 17 Drawing Figures

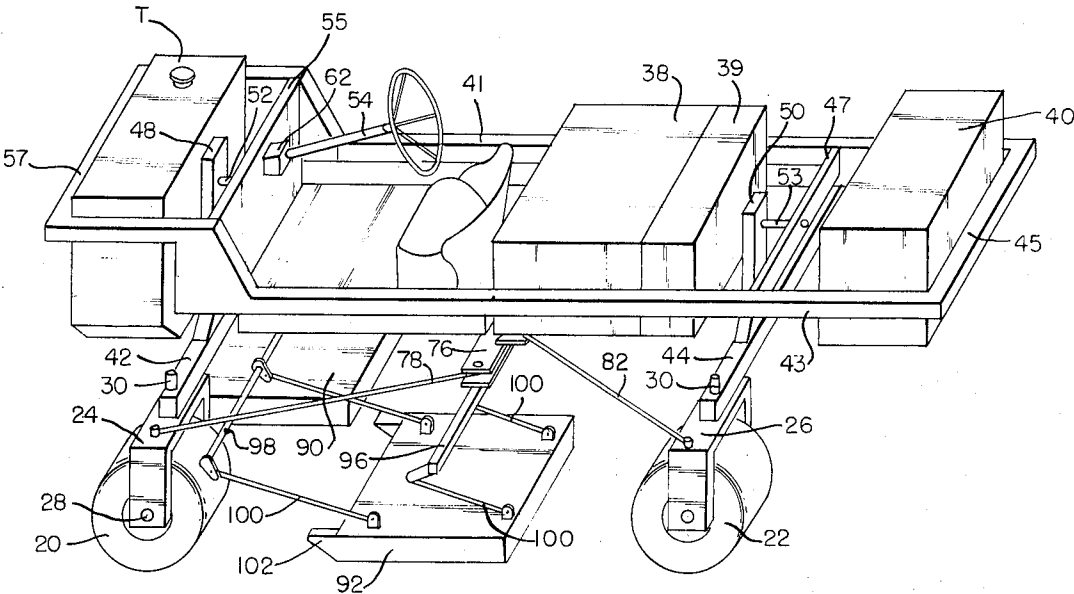


FIG. 1.

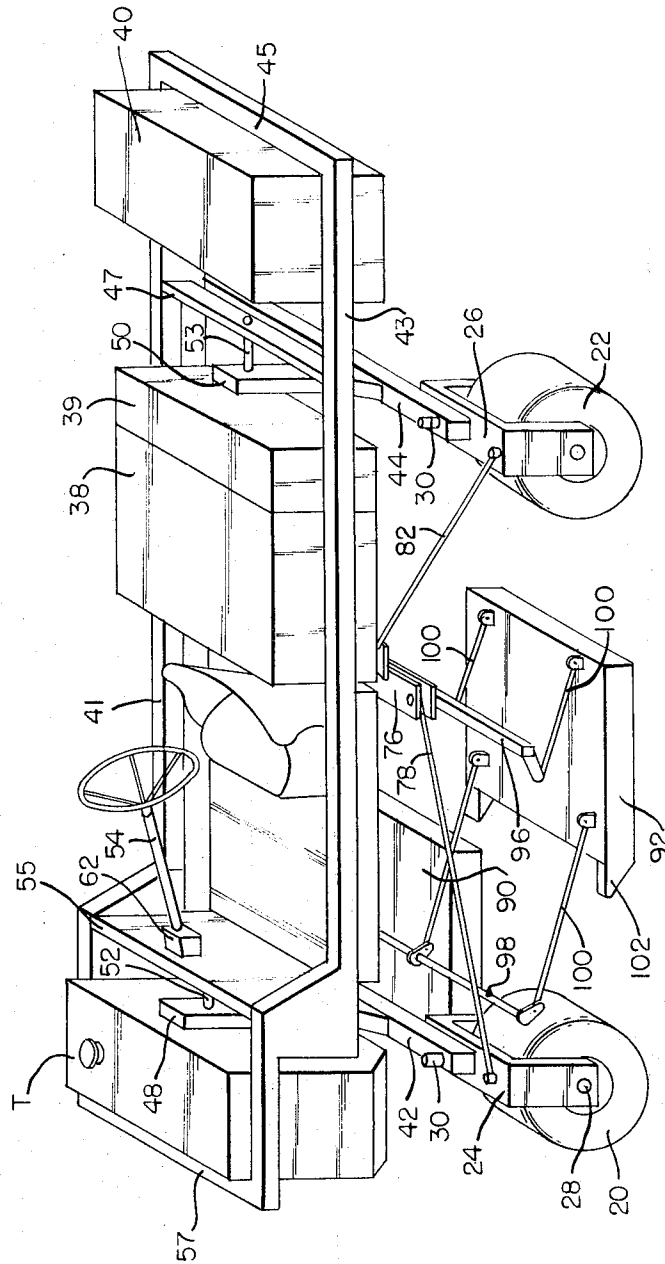


FIG. 2.

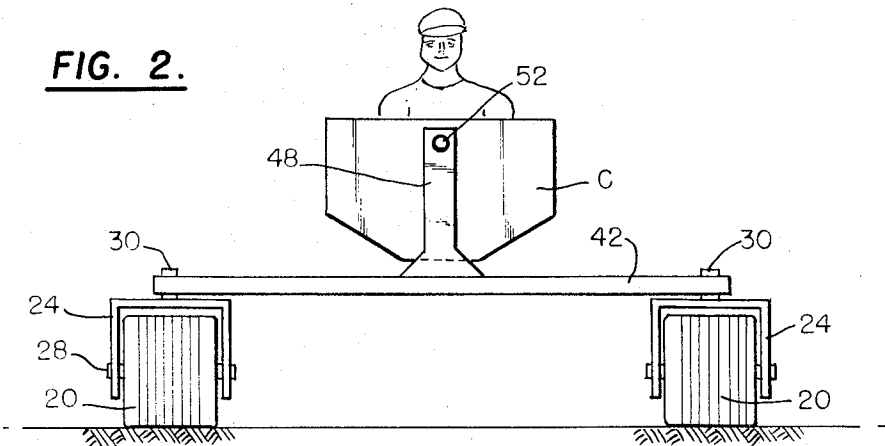


FIG. 3.

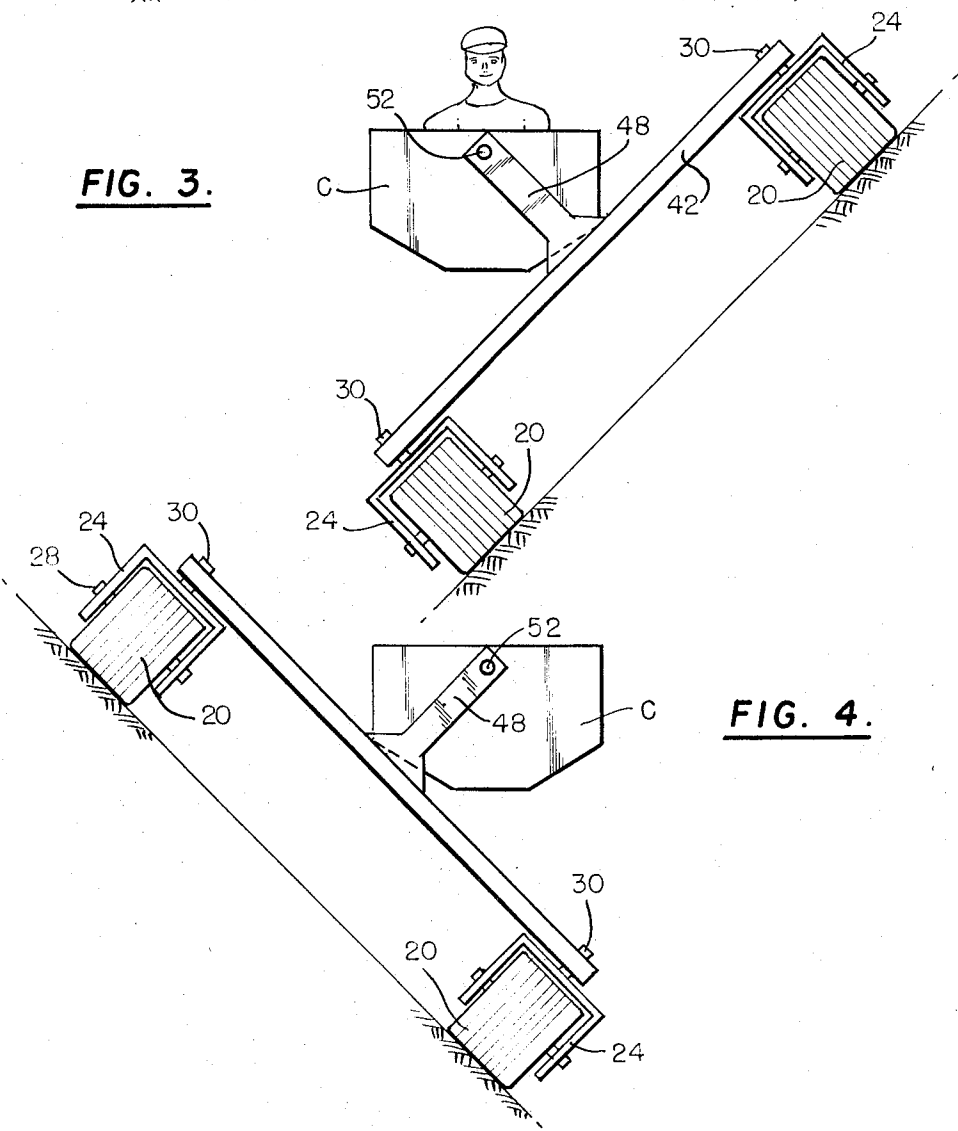


FIG. 4.

FIG. 5.

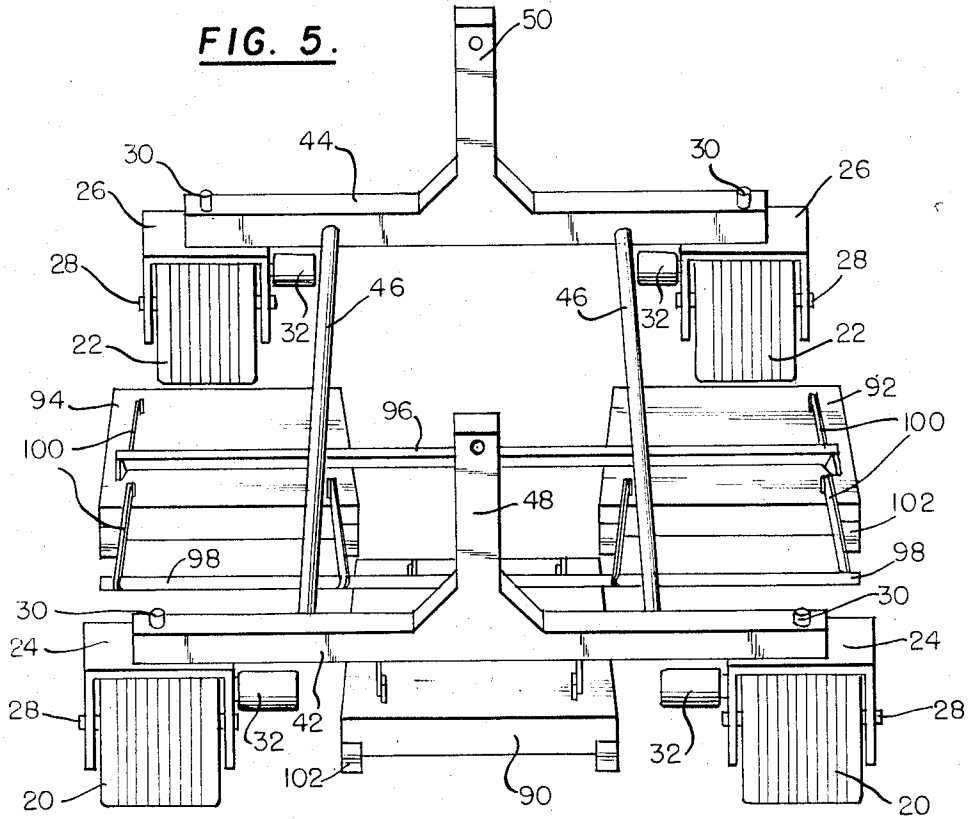


FIG. 6.

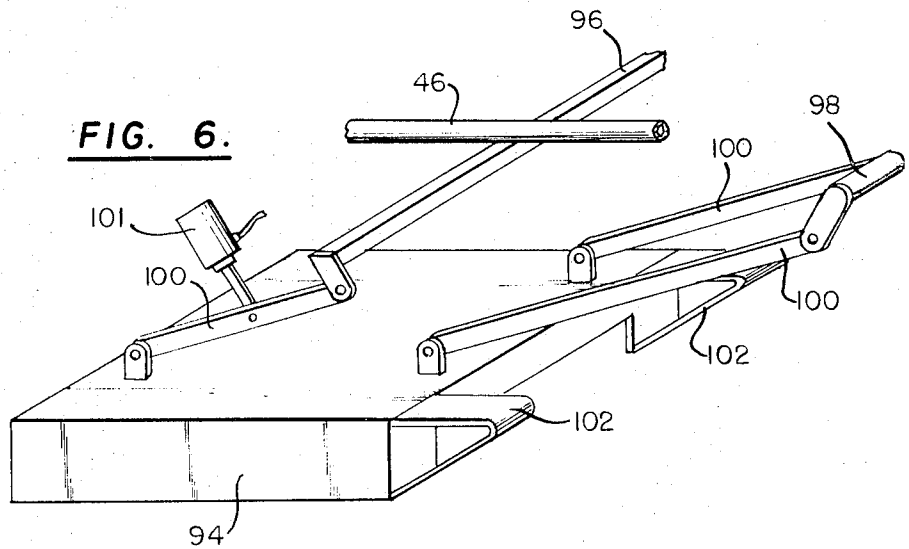


FIG. 10.

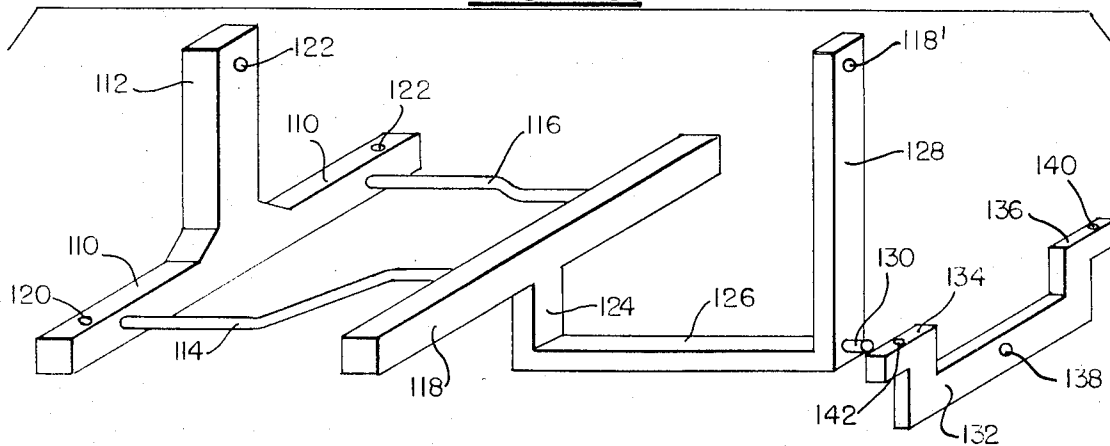


FIG. 11.

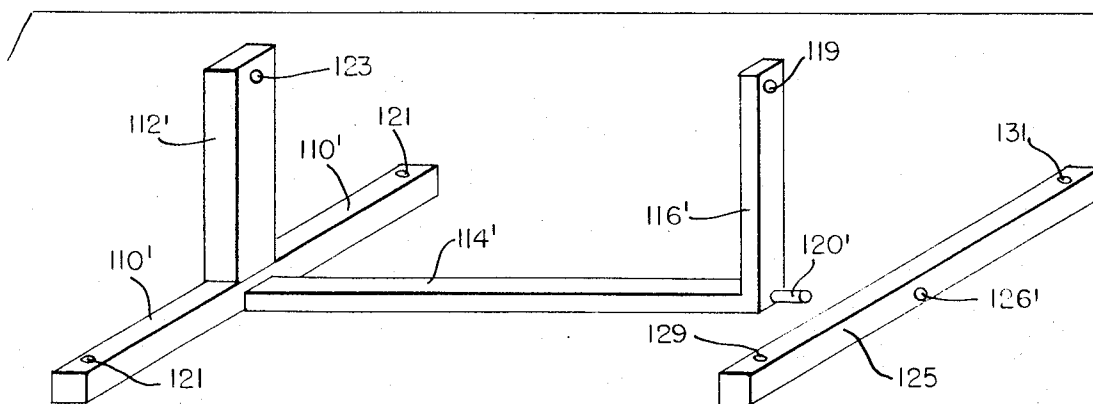


FIG. 13.

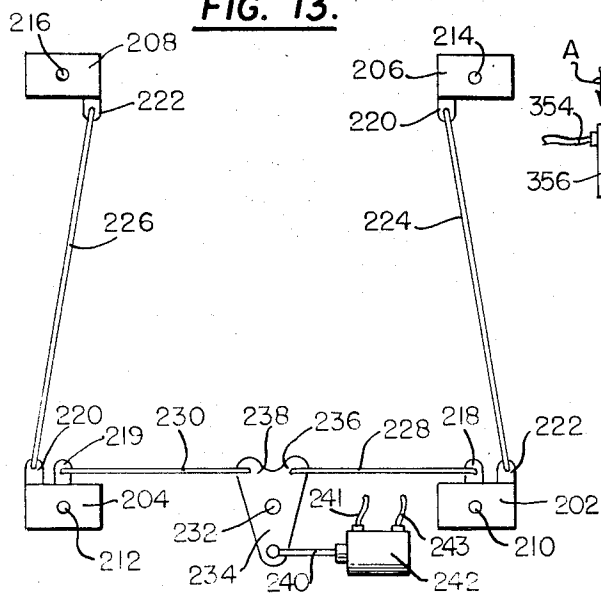
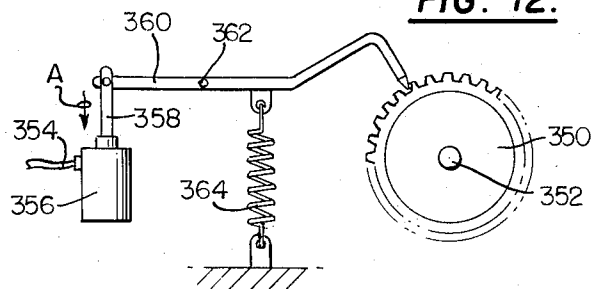


FIG. 12.



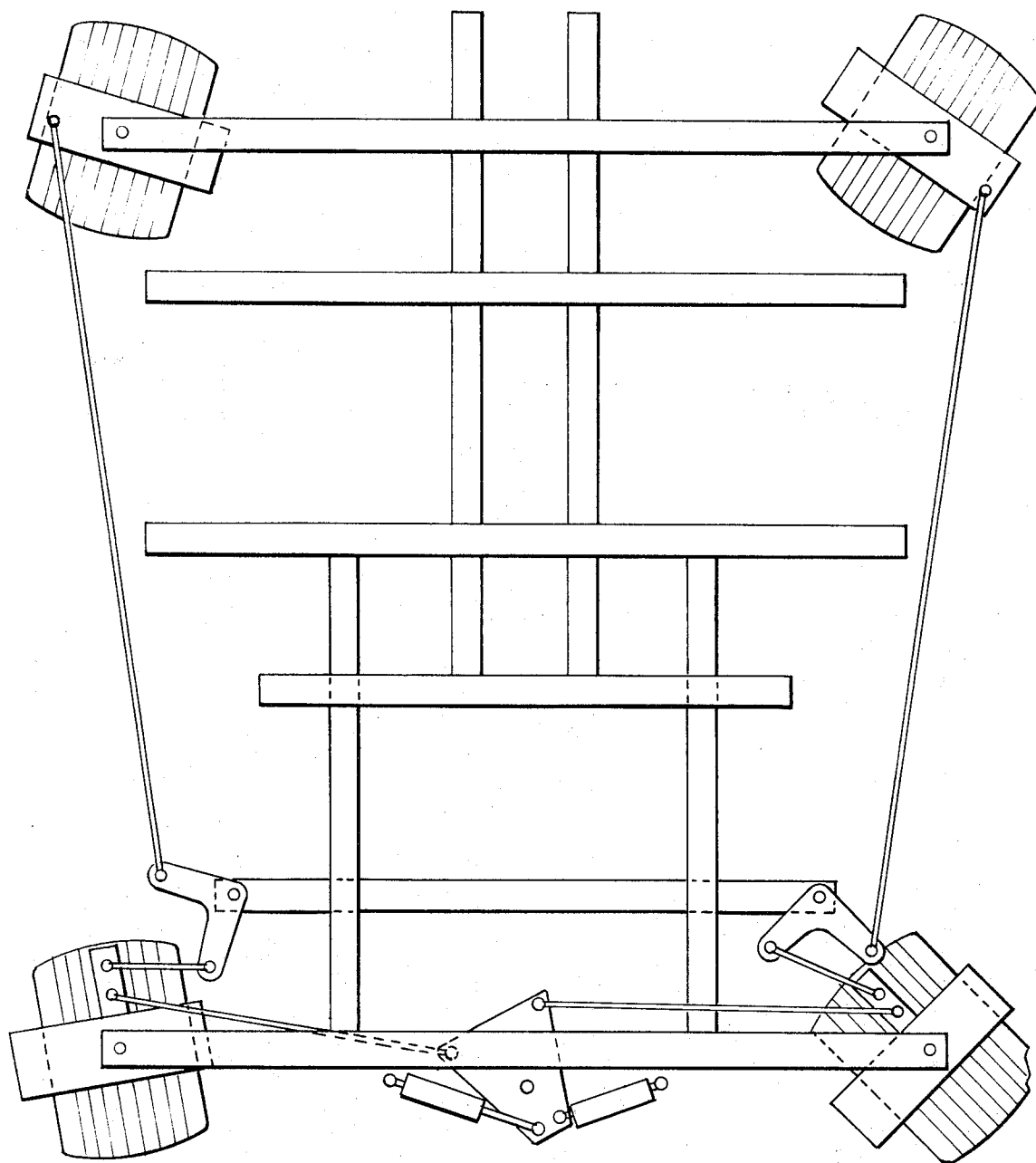


FIG. 14.

FIG. 15.

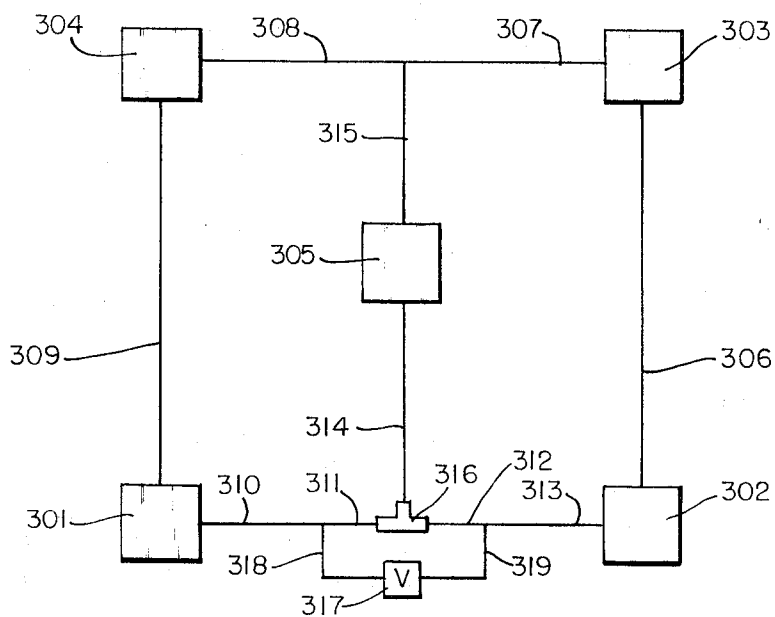


FIG. 16.

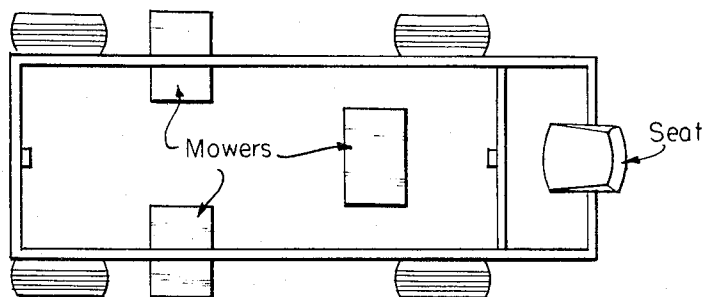
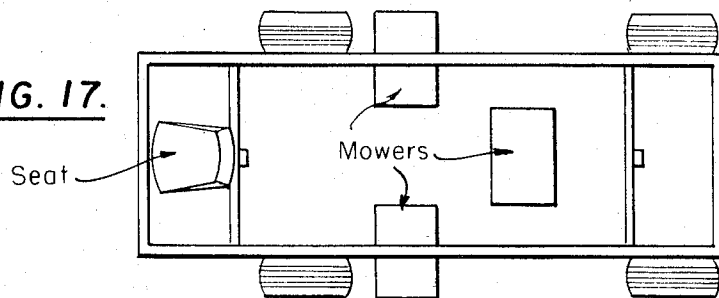


FIG. 17.



MOWING DEVICE

BACKGROUND

Many types of mower units have been proposed by prior art workers and quite a few are on the market today. The following patents illustrate some of the different types of mowing devices that have been proposed by prior art workers.

871,203	1,397,365	1,897,543	1,911,516
1,953,394	2,165,851	2,187,981	2,249,633
2,411,623	2,422,044	2,457,693	2,471,311
2,494,271	2,539,934	2,576,886	2,579,837
2,588,004	2,616,238	2,617,242	2,648,940
2,654,986	2,673,437	2,674,500	2,688,833
2,690,639	2,703,954	2,732,675	2,737,772
2,769,295	2,777,272	2,782,943	2,782,943
2,786,320	2,791,953	2,796,713	2,815,048
2,826,129	2,832,183	2,859,578	2,863,273
2,952,109	2,974,468	2,982,080	2,984,960
2,997,835	3,003,299	3,023,561	3,023,818
3,032,956	3,043,074	3,045,413	3,058,285
3,061,996	3,063,225	3,085,385	3,087,296
3,103,090	3,177,638	3,237,388	3,274,762
1,851,866	2,711,067	2,838,124	2,839,147
2,862,343	2,972,850	2,989,134	2,991,612
3,053,033	3,054,468	3,059,397	3,135,079
3,269,100	3,402,536	3,404,518	3,408,798
3,433,003	2,909,882	3,579,965	

It will be noted that a number of these patents are concerned with insuring that part or all of the mower unit conform to sloping ground, since nearly all mowers have to traverse slopes, ridges, and valleys. However, the prior inventors of mowing devices do not seem to have devoted much time to thinking about either the operator or the mower engine when the mower device is operating on sloping ground. For example, if a mower device has to operate on a 15°-40° slope for any length of time, it is quite tiring for the operator to have to lean in the direction opposite to the slope in order to maintain a generally upright position. Also, when a mower unit operates on a 15°-40° slope for a substantial length of time there is the danger that the oil in the engine will assume a level other than where it should be for optimum functioning of the engine.

OBJECTS

It is therefore an object of my invention to provide a mowing device which can operate over both level and sloping ground with maximum efficiency and minimum driver fatigue.

Other objects and advantages of the invention will become more readily apparent after reading the following description in conjunction with the attached drawings.

THE PRESENT INVENTION

Considered from one aspect, the present invention can be considered as comprising a mower device which is particularly well adapted to operate on slopes that are at an acute angle with respect to the horizontal. I feel that the most desirable embodiment of my invention from a commercial point of view would include:

- a plurality of spaced apart wheel units, each of which includes a wheel support means,
- drive means for at least one of said wheels,
- a main framework interconnecting said four wheel support means,
- at least one mower section supported by said main framework, each said mower section being adapted to cut grass, weeds or brush therebeneath,

- two spaced apart cradle unit support means located at spaced apart points on said main framework,
- a cradle unit pivotally supported by said spaced apart cradle unit support means in such a manner that at least the lower part of said cradle unit can swing through a limited arc with respect to said main framework so that the cradle unit can maintain an essentially "level" attitude at all times,
- a seat for the operator of said mower, said seat comprising a part of said cradle unit so that said seat can also maintain an essentially level attitude at all times,
- a steering control unit located on said cradle unit which is adapted to be manipulated by the operator,
- a wheel turning mechanism located on a portion of the mower device other than the cradle unit which is capable of turning at least one of said wheels, and
- a motor driven pump for generating a pressurized hydraulic fluid system, said motor driven pump being located on said cradle unit,
- one portion of said pressurized hydraulic system interconnecting said wheel drive means set forth in (a) with the said motor driven pump located on said cradle unit,
- a second portion of said pressurized hydraulic system interconnecting the said steering control unit, the said wheel turning mechanism and said motor driven pump located on said cradle unit.

THE DRAWINGS

Referring now to the drawings:

FIG. 1 is a side perspective view, slightly from above, showing a first embodiment of a mower device in accordance with this invention;

FIGS. 2, 3, and 4 are front semi-schematic views illustrating how the cradle unit of the mower device of this invention can maintain itself in an essentially level condition regardless of the contour of the ground that the mower device is traversing;

FIG. 5 is a front perspective view of a mower device in accordance with one embodiment of my invention illustrating the relative positional relationship of the wheel units, the main frame, the cradle unit supporting means and the mower sections;

FIG. 6 is a side perspective view showing how a mower section is suspended by means of hangers from the main frame;

FIG. 7 is an enlarged fragmentary perspective view showing one embodiment of wheel turning mechanism in accordance with this invention;

FIG. 8 is a fragmentary perspective view showing a preferred type of wheel unit in accordance with this invention;

FIG. 9 is a fragmentary perspective view showing a steering control unit useful in accordance with this invention;

FIGS. 10 and 11 are exploded views of other types of frameworks that may be used in connection with my invention;

FIG. 12 is a simplified sketch of a safety device for locking the wheels;

FIG. 13 is a plan-type diagrammatic sketch illustrating a wheel turning mechanism useful for a mower device;

FIG. 14 is a plan-type diagrammatic sketch showing the angular disposition of the wheels of a mower device when using a wheel turning mechanism of the type set forth in FIG. 13; and

FIG. 15 is a sketch showing a preferred hydraulic circuit for use with the hydraulic motors that drive the wheels.

FIGS. 16 and 17 are schematic views showing alternative seat arrangements with respect to mower placement.

The present invention can be better understood by referring to the drawings in conjunction with the following description.

(A) THE WHEEL UNITS

The mower unit of this invention has a plurality of wheel units, each preferably comprising a wheel frame and a wheel mounted therein. Four wheels are preferred because it has been found that this number gives the maximum stability under most conditions of use, although a greater or lesser number of wheels can be employed if desired. The drawings show two front wheels 20 and two rear wheels 22.

The wheels are preferably rather wide pneumatic tires of relatively low air pressure. Such wheels are commercially available from the Goodyear Company ("Terra-Grip" tires) and U.S. Pat. No. 3,433,003 is an example of a patent which already mentions the use of such wheels. The wheels 20 and 22 are preferably mounted in U-shaped wheel frames 24 and 26 respectively in such a manner that the wheels can rotate about essentially horizontal axles 28.

Each of the wheel frames 24 and 26 is preferably mounted adjacent a corner of the main framework of the mower device by vertical spindles 30.

(B) WHEEL DRIVING MEANS

The wheels of the mower unit of this invention are preferably driven by hydraulic power, which of course involves providing a source of hydraulic pressure and then connecting this hydraulic pressure source to hydraulic motors adjacent at least some of the wheel units by means of hydraulic hoses. The hydraulic motors adjacent a wheel can either drive the axles of the wheels directly or, as shown in FIGS. 5 and 8, hydraulic motors 32 can transmit power through a chain 34 and sprocket 36 arrangement to the axle 28 of the wheel. The hydraulic motors can drive the wheels in either a forward or rearward direction.

A preferred hydraulic system for interconnecting the hydraulic motors that drive the wheels is illustrated in FIG. 15. In this figure, the four hydraulic motors 301, 302, 303, and 304 and hydraulic pump 305 are shown as being interconnected by hydraulic lines 306-315. Also shown is a flow divider valve 316 and a by-pass valve 317 (and its associated hydraulic lines 318 and 319). When this arrangement is in use and the mowing device is moving over level ground by-pass valve 317 will be open and the flow divider valve 316 will be bypassed. Under this condition unequal amounts of fluid can flow to the various hydraulic motors 301-304, but this is desirable in order that the mowing device be able to make turns. However, when the mowing device is to operate along the side of a hill, the wheels which are on the lower side of the hill will bear the major part of the weight of the mower device, while the wheels that are on the upper part of the hill will bear considerably less

weight. Under such circumstances the wheels on the upper side of the hill may spin because most of the oil is free to flow where it wishes and it will favor the path of least resistance. To avoid this undesirable situation, I provide some manual means (to be actuated by the operator) or some automatic means for closing the by-pass valve 317 so that the hydraulic fluid is then forced to pass through the flow divider 316 and be equally distributed to each wheel, thus preventing the wheels on the high side of the hill from spinning. This arrangement is also most useful when one or more wheels get into mud and there is a tendency for one or more of the wheels to spin. (Flow-divider valves and by-pass valves can be purchased from any supplier of hydraulic equipment.)

(C) THE MAIN FRAMEWORK

A main framework interconnects the wheel units of the mower device of the present invention. The exact way in which this main framework interconnects the wheel units is not critical, although some arrangements may be preferable to others depending upon the area in which the mower is to be used, continuity of use, economy, etc.

For example with reference to FIGS. 1-7, when there are two front wheel units and two rear wheel units, a first cross member 42 can laterally interconnect the front wheel units and a second cross member 44 can laterally interconnect the two rear wheel units. One or more longitudinal frame members 46 can interconnect the first and second cross members (42 and 44). Alternatively, diagonal members (not shown) could be used to interconnect the first and second cross members.

Alternatively, one front wheel unit can be connected to the wheel unit behind it by a first longitudinal member and then the other front wheel unit can be connected to the wheel unit behind it by a second longitudinal member, and these longitudinal members interconnected by means of one or more cross members or two or more diagonal members.

The cross members 42 and 44 are shown as having holes adjacent their outer ends in order to accommodate the vertical spindles 30, which have been described earlier.

FIG. 10 shows another type of main framework arrangement that can be used in connection with my invention. It generally comprises two separate frame sections that can pivot with respect to each other. The first section consists of cross members 110 and 118 that are interconnected by longitudinal members 114 and 116. Cross member 110 is shown as having openings 120 and 122 therein in order to accommodate the vertical spindles 30 that are shown in FIGS. 1-9. Forwardly of cross beam 118 there is provided a generally J-shaped construction consisting of members 124, 126 and 128. The other section constituting the two-section main framework arrangement shown in FIG. 10 is the cross member 132 which is shown as having angled end members 134 and 136 which are provided with openings 140 and 142 in order to accommodate the vertical wheel spindles shown in FIGS. 1-9. The aforesaid first section is provided with a stub shaft 130 or the like which is adapted to fit within opening 138 in the cross member 132 so that the cross member 132 will have at least a limited ability to pivot through a vertical plane around the stub shaft 130.

FIG. 11 shows a main framework arrangement that is very similar to that shown in FIG. 10, but it is somewhat simpler. For instance, the first section consists of cross member 110' and a longitudinal member 114'. Cross member 110' is provided with openings 121 for the reception of spindles 30. The second section comprises an elongated cross member 125 having openings 129 and 131 in the ends thereof for the reception of vertical spindles 30 and an opening 126' for the reception of the stub shaft 120' of the first section so that the cross member 125 can pivot to at least a limited extent through a vertical plane about said stub shaft 120'.

(D) THE MOWER SECTIONS

The mowing apparatus of this invention contains at least one and preferably three mower sections that are located beneath the main framework. For instance, as is shown in FIGS. 1, 5 and 6, a front mower section 90 is located between the front wheels 20 and two other mower sections 92 and 94 are located rearwardly and somewhat laterally of the front mower section 90. The mower sections preferably consist of rotary blades that are driven by hydraulic motors (not shown) located on each mower section. The motors are preferably connected in a series circuit. The mower sections may be supported from the main framework in a number of different ways. For example, longitudinal members 46 may have cross members 96 and 98 attached thereto by welding or the like, and cross members 96 and 98 in turn pivotally support a plurality of hanger bars 100. The lower ends of the hanger bars 100 are pivotally attached to the top of the mower sections, which thus permits the mower sections to be moved either upwardly or downwardly, and individually or all at once. As shown in FIGS. 1, 5 and 6, the mower sections may have skids 102 on the front side and the longitudinal side edges so as to facilitate movement over rough ground and so as to maintain a uniform height of cutting.

The mower sections can simply be suspended or "hung" as is shown in FIGS. 1, 5 and 6 so that they will always ride along on the surface of the ground. However, it is preferable to have some means for lifting the mower sections to a fixed position (e.g. 1.5 to 11 inches) above the ground, either because a higher cut is desired, or because the operator desires to pass over rocks or other obstructions that would damage the mower blades. The lifting means for each mower section in its simplest form may consist of a short length of chain or cable attached between the top of the mower section and a portion of the main framework so that the length of the chain or cable can be varied, which will in turn vary the height of the mower section above the ground. Alternately a cable and pulley arrangement can be used, or a single or double-acting hydraulic cylinder (such as 101) which will interconnect the top of the mower section or one of the hangers with a part of the main framework.

(E) CRADLE UNIT SUPPORT MEANS

In accordance with this invention the main framework is provided with two spaced apart cradle unit support means. These support means ordinarily extend above the wheels, unless high tires are used. The simplest form of a cradle unit support means in accordance with this invention comprises two spaced apart vertical posts affixed on said main framework and approxi-

mately aligned along the central longitudinal axis thereof. More specifically, in FIGS. 1-5, front post 48 extends upwardly from first cross member 42 and rear post 50 extends upwardly from the second cross member 44. In FIG. 10, 128 and 112 are the front and rear cradle unit support means. In FIG. 11, 116' and 112' are the front and rear cradle support means. Openings 122, 118', 123 and 119 are adapted to receive longitudinally extending shafts on the cradle unit (such as the shafts 52 and 53 shown in FIGS. 1-9).

(F) THE CRADLE UNIT

In FIG. 1, the cradle unit is seen to comprise a rectangular framework consisting of elongated side members 41 and 43 and cross members 45, 47, 55 and 57. In FIG. 1 it will be seen that this cradle unit is pivotally supported between cradle unit support means 48 and 50 by means of shafts 52 and 53 and this cradle unit is adapted to swing through at least a limited arc with respect to said main framework so as to always maintain an essentially level position. The swingability of the cradle unit is perhaps best illustrated by FIGS. 2, 3 and 4. In these figures the cradle unit is generally designated by C and it is seen that the front end of cradle unit C is pivotally supported on the front post 48 by means of a pivot means 52. When the mower unit is on level ground, the cradle unit will be level, as is shown in FIG. 2. When the mower unit is mowing over sloping ground (as is shown in FIGS. 3 and 4), the cradle unit C will swing through an arc with respect to the main frame in such a way as to permit the cradle unit to maintain essentially the same level posture that it has on level ground. Maintaining the cradle unit C in a level position is advantageous in that it increases the operator's feeling of safety, reduces operator fatigue, increases the stability of the mower unit and avoids undesirable tilting of either the internal combustion engine or the hydraulic pump or the hydraulic fluid reservoir.

The swinging of the cradle unit through an arc may be "damped" by springs if desired. Double acting hydraulic cylinders may also be used to modify the position of the cradle unit from that which it would assume under the influence of gravity alone. Such cylinders could be actuated by the operator, or by gravity controlled switches, or by a combination of such means.

The center of gravity of the cradle unit should be maintained below the level of the shafts 52 and 53 in order to maximize stability. Considered in another way, I feel that it is preferable for the cradle unit to be supported in my mowing device so that when the center of gravity of the cradle unit is projected downwardly, it will always intersect the ground at a point which is between the left and right wheels (when considering the steepest slope on which the mower device is designed to operate).

(G) THE OPERATOR'S SEAT

The cradle unit is adapted to carry, in addition to the items mentioned above, a cockpit or operator's seat. As shown in FIG. 1, the operator's seat is firmly fixed between the sides of the cradle unit, approximately halfway between the front and rear of the cradle unit. Thus, when the mower device is moving over sloping ground (see FIGS. 3 and 4), the operator's seat will swing with the cradle unit so that the operator will be continuously maintained in an upright position. The operator will

thus not tire himself by trying to lean first one way then the other in order to maintain an upright position.

The operator's seat can be mounted on the very front of the cradle unit, if desired, (see FIG. 17) in which event the operator has the opportunity to get a better look at the terrain before the mowers pass over it. He can thus avoid rocks and debris that would damage the mowers. The operator's seat can also be mounted on the very back of the cradle unit (e.g. in place of unit 40 or to the rear of cross member 45) and this enables the operator to inspect the mowed area to see whether the mowers are working properly (see FIG. 16). From a psychological point of view an operator may prefer to be on the very front or the very back when working on steep slopes, because he feels that he would be safer in jumping off the machine in the event it started to tip.

(H) THE STEERING CONTROL UNIT

The cradle unit also carries a steering control unit which is located adjacent to the operator's seat and which is adapted to be manipulated by the operator. FIG. 9 shows such a steering control unit, which comprises a steering column 54 that is pivotally mounted at 56 so that by appropriate engagement or disengagement of the spring loaded locking pin 58 with holes 60 the desired angular disposition of the steering column can be selected by the operator. The operator can thus stand up and steer if the need arises. The lower end of the steering column 54 enters a transducer unit 62 which converts an appropriate mechanical rotational movement of the steering wheel into an incremental change in hydraulic pressure that is in turn transmitted through one or more of the lines 64, and this hydraulic pressure is in turn converted into mechanical movement, as will be described in more detail hereinafter. Such hydrostatic steering control units are available on the market.

The steering control unit could be mounted on a portion of the main framework rather than on the cradle unit, but I do not think that this would be as satisfactory as mounting the steering control unit on the cradle unit because when the mower device was operating over undulating ground the operator would be swinging with the cradle unit yet the steering wheel would not. This would therefore probably require that the driver frequently shift his hands on the steering wheel in order to satisfactorily maintain the mower device on a desired line of travel. In my opinion this would be an unnecessary strain on the operator and I do not think that this strain could be counterbalanced by whatever advantages in construction there might be in mounting the steering control unit on the main framework.

(I) THE WHEEL TURNING MECHANISM

A wheel turning mechanism is located on a portion of the mower device other than the cradle unit which is capable of turning at least one of said wheels (20, 22). For example, referring to FIG. 7, movement of the cylinder rod 65 of hydraulic cylinder 66 in the direction indicated by the arrow H will cause the arm 70 to rotate the shaft 72 in a clockwise direction. Since plates 74 and 76 are welded to the outside of shaft 72, plates 74 and 76 will also rotate in a clockwise direction and whenever plates 74 and 76 rotate, drag lengths 78, 80, 82 and 84 will also be moved so that the wheel units to which they are attached will in turn be rotated about spindles 30.

Another wheel turning mechanism useful in accordance with my invention is illustrated in FIG. 13, which is a plan view showing how the wheel turning mechanism would be arranged so as to be able to influence the movement of wheel frames 202, 204, 206 and 208. A double-acting hydraulic cylinder 242 is actuated by the pressurized hydraulic fluid entering through hoses 241 and 243, which are in turn operatively connected to the hoses 64 of transducer 62 (see FIG. 9). As the piston rod 240 moves in and out it will cause the steering quadrant 234 to rotate about pivot 232. The steering quadrant has spaced apart portions 236 and 238 to which drag links 228 and 230 are pivotally attached. The other ends of drag links 228 and 230 are pivotally attached to ears 218 and 219 on wheel frames 202 and 204, so that when the drag links 228 and 230 are moved by the movement of steering quadrant, the wheel frames rotate about the spindles 210 and 212. When the wheel frames 202 and 204 rotate, the fore and aft drag links 224 and 226 will rotate wheel frames 206 and 208 about the spindles 214 and 216. (Drag links 224 and 226 are preferably connected to the wheel frames by means of ball socket connections 220-222 so as to permit both lateral and vertical freedom of movement.)

The wheel turning mechanism described above is particularly useful with my mowing device because it is desirable for my device to be short and wide, and preferably about as wide as it is long.

When turning with the wheel turning mechanism shown in FIG. 13, the inside front wheel will be turned inwardly to a greater extent than the outer front wheel. Similarly, the back inside wheel will be turned outward to a greater extent than the outer back wheel. This is illustrated in FIG. 14.

(J) OTHER COMPONENTS CARRIED BY THE CRADLE UNIT

In addition to the aforementioned operator's seat and the steering control unit, the cradle unit of this invention preferably carries several other components. For example in FIG. 1 some of these components include a tank T for fuel, a battery, an internal combustion engine and hydraulic pump (indicated in a very general manner in the drawings by schematic block inserts 38 and 39 respectively), and a hydraulic reservoir (indicated in a very general way in the drawings by schematic block unit 40). The primary function of the engine 38 in the embodiment illustrated in this application is to supply power to run the pump 39 so that the pump will in turn maintain a pressurized hydraulic system.

For the sake of clarity, the drawings do not include a showing of all of the hydraulic system and the hydraulic hoses which extend from one portion of the device to another. However, hydraulic hoses are used to interconnect the wheel drive means set forth in section (B) above with the pump 40 for producing pressurized hydraulic fluid. These hoses constitute a non-rigid power linkage between the cradle unit and the wheel drive means, which in turn permits the cradle unit to swing freely without in any way affecting the power linkage. Likewise hydraulic hoses interconnect the steering control unit set forth in (H), the hydraulic cylinder 66 of the wheel turning mechanism set forth in (I), and the pump 40. Fragments of such hoses 64 are shown in FIG. 9. Again, these hoses constitute a non-rigid power

linkage between the cradle unit and the remainder of the mower device so that the cradle unit can swing freely (as shown in FIGS. 3 and 4) without in any way affecting the power linkage.

SAFETY DEVICES

I have developed several safety mechanisms for my mowing device. One such safety device will lock the wheels shown if either the hydraulic power fails or the main engine stops, so that if the operator is working on the side of a steep hill and either of these things occur, the wheels will lock and the operator will be in no danger that the mowing device will roll down the hill. One such safety device is illustrated in FIG. 12 wherein 350 is a gear-tooth wheel journaled to the axles 352 of the wheels on the mowing device. So long as the engine of the mower device is operating and so long as pressurized hydraulic fluid is being developed the pressurized fluid entering through hydraulic line 354 will cause the hydraulic cylinder 356 to retract piston rod 358 in the direction of arrow A, which will in turn cause the pivoted lever arm 360 (pivoted about pivot 362) to rotate in a counter-clockwise direction. Such rotation will cause the right-most end of the lever arm 360 to move out from between the teeth of the gear-tooth wheel 350 so that it is free to rotate. Cylinder 356 thus overcomes the pull of spring 364 which would otherwise pull the right end of the lever arm into the position shown. However, once the engine is turned off and there is no longer any pressurized fluid to pull the piston rod 358 in the direction of arrow A, the normal biasing action of the spring 364 will take over, forcing the lever arm 360 into the position shown and locking the wheel against movement. A similar arrangement can be worked out using a solenoid in place of the hydraulic cylinder, or even by using a solenoid device without a spring.

Of course, my mower device may also be provided with conventional brake mechanisms if desired.

Although I have described the preferred embodiments of my invention in terms of hydraulic motors for driving the wheels and for steering, it will be understood that no invention would be involved in replacing the hydraulic motors with electrical motors and the hydraulic circuitry with electrical circuitry. The use of electrical circuitry would still permit the power linkages between the cradle unit and the rest of the mower to be non-rigid rather than rigid.

In conclusion, while there has been illustrated and described some preferred embodiments of my invention, it is to be understood that since the various details of construction may obviously be varied considerably without really departing from the basic principles and teachings of this invention, I do not limit myself to the precise constructions herein disclosed and the right is specifically reserved to encompass all changes and modifications coming within the scope of the invention as defined in the appended claims. Having thus described my invention, what

I claim as new and desire to secure a United States Letters Patent is:

1. A mower device which is particularly well adapted to operate on slopes that are at an acute angle with respect to the horizontal which device comprises in combination:

- a. four spaced apart wheel units, each of which includes a wide tread tire mounted on a wheel and wheel support means,
 - b. a hydraulic motor for driving said wheels,
 - c. a main framework interconnecting said wheel support means, said main framework comprising a front axle section connecting the front wheel units and a rear axle section interconnecting the rear wheel units, said front axle section being mounted so that it can pivot through a vertical plane,
 - d. at least one mower section supported by said main framework, each said mower section being adapted to cut grass, weeds or brush therebeneath,
 - e. two spaced apart cradle unit support means located at spaced apart points on said main framework and extending above the level of the wheel units,
 - f. a cradle unit pivotally supported by said spaced apart cradle unit support means, in such a manner that said cradle unit can swing under the influence of gravity through a limited arc with respect to said main framework so that the cradle unit can be maintained in an essentially "level" attitude at all times, the center of gravity of said cradle unit being lower than the level of the points from which it is pivotally supported by said cradle unit support means,
 - g. a seat for the operator of said mower, said seat comprising a part of said cradle unit so that said seat can also maintain an essentially level attitude at all times, and
 - h. a steering control unit located on said cradle unit which is adapted to be manipulated by the operator,
 - i. a wheel turning mechanism located on a portion of the mower device other than the cradle unit which is capable of turning at least one of said wheels,
 - j. a motor driven pump for generating a pressurized hydraulic fluid system, said motor driven pump being located on said cradle unit,
 - k. one portion of said pressurized hydraulic system interconnecting said hydraulic motor with said motor driven pump located on said cradle unit,
 - l. a second portion of said pressurized hydraulic system interconnecting the said steering control unit, the said wheel turning mechanism and said motor driven pump located on said cradle unit.
2. A mower device according to claim 1 wherein said cradle unit includes an internal combustion engine that will swing through a limited arc with respect to the main framework at the same time that the cradle unit swings through a limited arc with respect to the main framework.
3. A mower device according to claim 2 wherein said cradle unit also includes a reservoir for hydraulic fluid and a hydraulic pump driven by said internal combustion engine.
4. A mower device according to claim 1 wherein there are three mower sections, two being disposed forwardly in a side-by-side manner and one disposed rearwardly and centrally of said two forwardly disposed mowers, all of said mowers being located behind the front wheels and in front of the back wheels.
5. A mower device according to claim 1 wherein said wheel turning mechanism includes:

- a. drag rods connected at their outer ends to wheel units in such a manner that both vertical and horizontal movement is possible,
 - b. the inner ends of said drag rods being attached to a centralized lever device located intermediate the sides of the mower device and intermediate the front and back ends of said mower device;
 - c. said lever device being mounted for pivotal movement about an axis;
 - d. at least one double-acting hydraulic cylinder for causing said lever means to pivot about its axis; and
 - e. means for hydraulically interconnecting said at least one double-acting hydraulic cylinder to the steering control unit.
6. A mower device according to claim 1 wherein at least one mower section is suspended from said main framework by means of at least two hangers that can be pivoted around a fixed point connected to the main framework.
7. A mower device according to claim 1 wherein the hydraulic means for driving each of the wheels consists of a hydraulic motor and associated chain and sprocket means for driving the axle of a wheel.
8. A mower device according to claim 1 wherein said steering control means includes a steering wheel mounted on a steering column and the angular disposition of said column is mounted with respect to the main framework so that its angular disposition can be varied.
9. A mower device according to claim 1 wherein the mower device includes three mower sections all of which are under a common hood that can be raised as desired by the operator.
10. A mower device according to claim 1 wherein the operator's seat is located on said cradle unit and forwardly of both the front wheels and the mower sections.
11. A mower device according to claim 1 wherein the operator's seat is located on said cradle unit and rearwardly of both the rear wheels and the mower sections.
12. A mower device according to claim 1 wherein said wheel turning mechanism causes the wheels that are on the inside of a turn to rotate to a greater extent than the wheels on the outside of the turn.
13. A mower device according to claim 1 wherein the hydraulic circuit interconnecting the hydraulic motors that drive the wheels includes a flow divider valve which can be actuated so as to cause a substantially equal flow of hydraulic fluid to all hydraulic motors whereby the wheels will be driven at approximately equal speeds during the time that the flow divider valve is being actuated.
14. A mower device according to claim 13 wherein the means for actuating said flow divider valve is located adjacent the operator's seat.
15. A mower device according to claim 1 wherein the

blades of each mower unit have tips to cause the grass therebeneath to lift up.

16. A mower device according to claim 1 wherein all mower units will raise or descend in unison.

17. A mower device according to claim 1 wherein each mower unit can be raised or lowered individually.

18. A mower unit according to claim 1 wherein the wheel turning mechanism causes the rear wheels to turn in a direction opposite to said front wheels.

19. A mower device which is particularly well adapted to operate on slopes that are at an acute angle with respect to the horizontal which device comprises in combination:

- a. a plurality of spaced apart wheel units, each of which includes a wheel and wheel support means,
- b. drive means for at least one of said wheels,
- c. a main framework interconnecting said wheel support means,
- d. at least one mower section supported by said main framework, each said mower section being adapted to cut grass, weeds or brush therebeneath,
- e. two spaced apart cradle unit support means located at spaced apart points on said main framework,
- f. a cradle unit pivotally supported by said spaced apart cradle unit support means in such a manner that said cradle unit can swing under the influence of gravity through a limited arc with respect to said main framework so that the cradle unit can be maintained in an essentially "level" attitude at all times, the center of gravity of said cradle unit being lower than the level of the points from which it is pivotally supported by said cradle unit support means,
- g. a seat for the operator of said mower, said seat comprising a part of said cradle unit so that said seat can also maintain an essentially level attitude at all times, and
- h. a steering control unit located on said cradle unit which is adapted to be manipulated by the operator,
- i. a wheel turning mechanism located on a portion of the mower device other than the cradle unit which is capable of turning at least one of said wheels,
- j. a motor driven pump for generating a pressurized hydraulic fluid system, said motor driven pump located on said cradle unit,
- k. one portion of said pressurized hydraulic system interconnecting said hydraulic motor with said motor driven pump located on said cradle unit,
- l. a second portion of said pressurized hydraulic system interconnecting the said steering control unit, the said wheel turning mechanism and said motor driven pump located on said cradle unit.

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