April 4, 1961 M. E. GERDES 2,978,251

OCCUPANT PROPELLED MULTIPLE RUNNER SLED

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Fig. 1

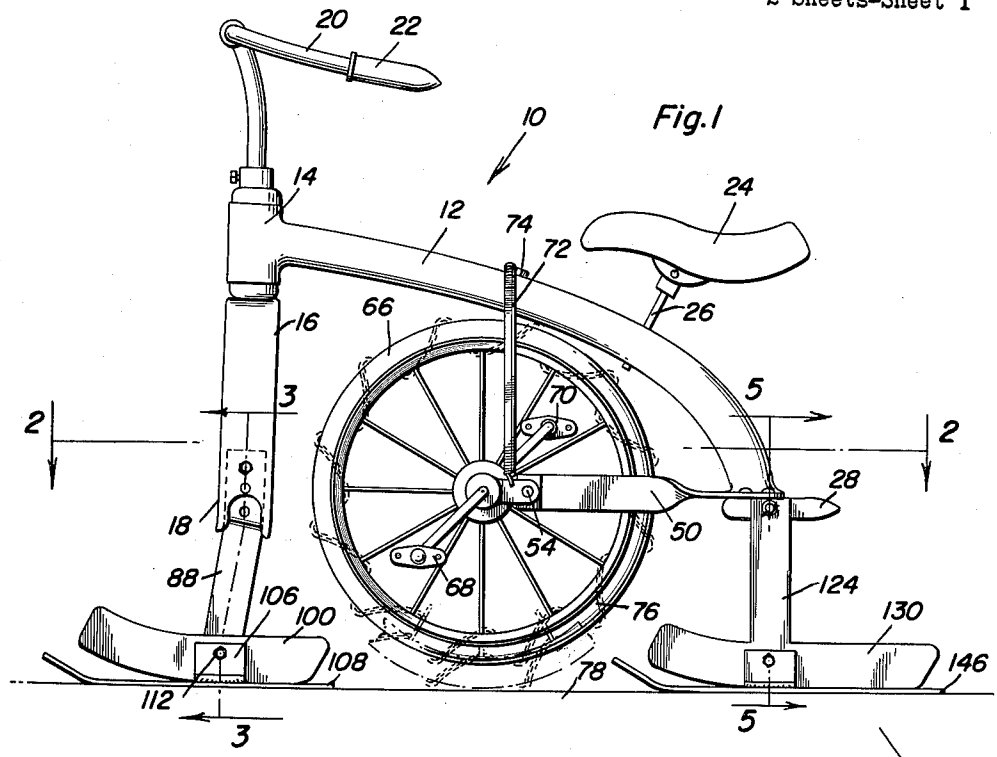


Fig. 3

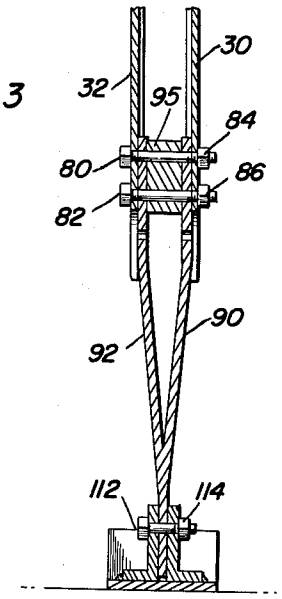
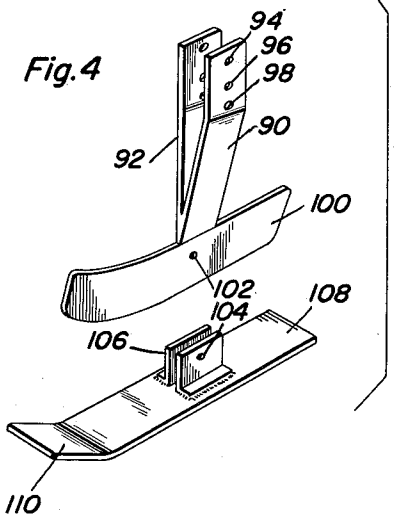


Fig. 4



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Fig. 2

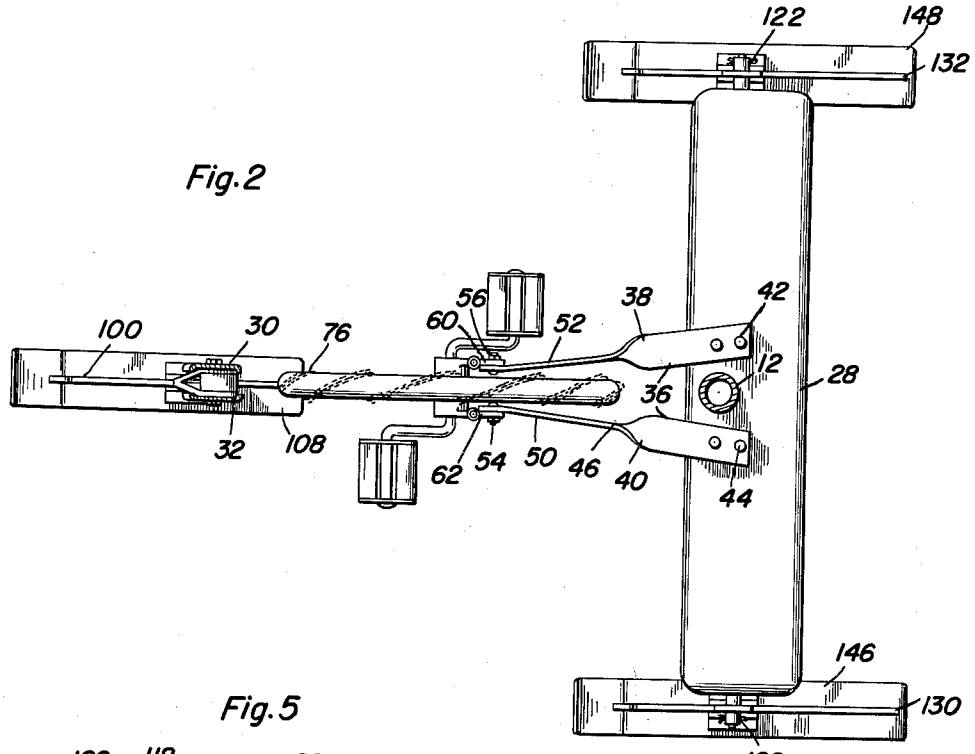


Fig. 5

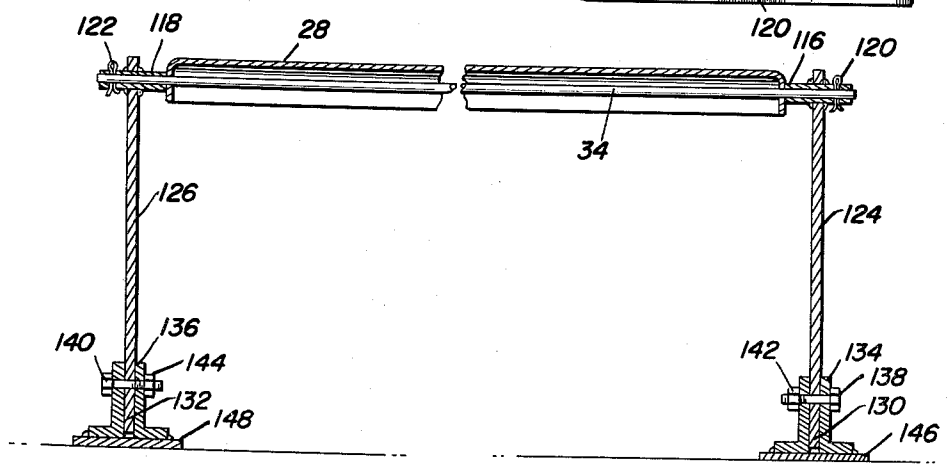
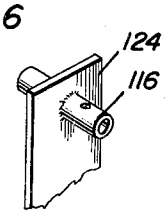


Fig. 6



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OCCUPANT PROPELLED MULTIPLE RUNNER SLED

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2 Claims. (Cl. 280—12.14)

This invention relates generally to a tricycle conversion kit and more particularly to a kit devised to adapt conventional tricycles for use on snow or ice.

It is a well known and well established fact that tricycles and bicycles provide entertainment and transportation for a wide portion of the population. While bicycles are generally for transportation, tricycles are utilized by young children as a part of their daily outdoor entertainment. The tricycles of course need a hard surface to provide the proper friction for initiating the rolling movement of the wheels. Therefore, the tricycling activity is generally confined to the spring, summer and fall seasons when the ground is not covered with snow. The development of a tricycle which would be adapted for utilization on snow or ice is desirable in that entertainment and exercise could be provided for children on the year around basis. It is therefore the principal object of this invention to provide a tricycle conversion kit which will allow conventional tricycles to be converted for use on snow and ice.

It is a further object of this invention to provide a tricycle conversion kit which is easy to install, reliable, and relatively inexpensive to manufacture.

It is a still further object of this invention to provide a tricycle conversion kit which enables the child to easily provide an impetus to the device by conventional pedalling motion while not hindering the slide motion of the device on ice or snow.

It is a still further object of this invention to provide a tricycle conversion kit for utilization of a conventional tricycle on ice or snow which includes means for compensating for undulations on the snow or ice, thereby maintaining the device substantially level.

In accordance with the above stated objects, below is described the details of a tricycle conversion kit for enabling the tricycle to be utilized on snow or ice. The kit calls for the utilization of the conventional tricycle frame including a front steering column, an arcuate body portion, and a rear cross member carrying the rear axle. The conventional forked steering column which generally holds the front wheel is utilized to hold a T-shaped member which has a runner pivotally connected thereto. The rear axle which generally terminally and rotatably carries the rear wheels carries a pair of T-shaped members which also pivotally support a pair of runners. The removed front wheel is rotatably supported by an arm pivotally connected to a yoke which is fixed to the cross member which is carried by the body portion. The pivotally supported arm has an aperture therein which accommodates the terminal portion of a spring which is suspended from the body portion. The resilient and pivotal relationship of the arm provides a resilient and pivotal relationship for the wheel rotational axis. A pair of pedals is provided for rotating the wheel on its axis and a vertical force on the pedals will pivot the arm about its pivotal connection to the yoke so that the wheel may contact the snow or ice to provide an impetus to the converted tricycle. It is contemplated that the wheels should carry

friction engaging means such as chains to allow for an efficient frictional engagement with the snow or ice. The spring is biased so as to normally keep the wheel out of engagement with the snow or ice so that the converted tricycle may glide along the snow or ice on the pivotal runners. The pivotal runners, pivoting individually, compensate for any undulations in the snow or ice.

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:

Figure 1 is a side elevational view of a converted tricycle utilizing the structure and concepts comprising this invention;

Figure 2 is a sectional view taken substantially along the plane 2—2 of Figure 1;

Figure 3 is a sectional view taken substantially along the plane 3—3 of Figure 1;

Figure 4 is a perspective view illustrating the interrelationship between a first depending T-shaped member and the first runner;

Figure 5 is a sectional view taken substantially along the plane 5—5 of Figure 1; and

Figure 6 is a fragmentary view illustrating the second or third T-shaped member supported on the sleeve surrounding the rear axle.

With continuing reference to the drawings, the numeral 10 generally represents a converted tricycle utilizing the principles of this invention. The invention utilizes the elements of a conventional tricycle including an arcuate body portion 12 having an integrally formed collar 14 for accommodating a steering column 16 terminated in a fork portion as at 18. Means for utilizing the steering column 16 and for steering the conventional tricycle include rearwardly extending handle bars 20 provided with grippers as at 22. A saddle seat 24 is supported above the arcuate body portion 12 by a longitudinal support member 26. The arcuate body portion 12 rearwardly terminates in a cross member 28.

In the conventional tricycle a front wheel is generally rotatably supported between the bifurcations 30 and 32 of the fork member 18. Further the rear axle 34 is rotatably supported in the cross member 28 in opposed and aligned apertures in depending walls of the cross member 28. The unmodified tricycle would support rear wheels on each end of the rear axle 34. In order to motivate the tricycle, pedals would conventionally be provided.

In the utilization of the teachings of this invention, the front wheel and rear wheels are removed from the tricycle. Initially, a yoke 36 including individual members 38 and 40 is bolted to the rear member 28 as by pairs of bolts 42 and 44. The members 38 and 40 extend forwardly and are bent along a portion of their length as at 46 so that flat horizontal surfaces may be formed adjacent the bolted end and vertical surfaces may be formed remote from the cross member 28. The vertical portions 50 and 52 include apertures for receiving nuts and bolts 54 and 56. The nuts and bolts 54 and 56 rotatably support a pair of parallel arms 62 and 60, respectively, which include aligned apertures for accommodating a wheel spindle. The parallel arms 62 and 60 limitedly rotate about an axis through the aligned nuts and bolts 54 and 56. Supported within the terminal portions of the parallel arms 62 and 60 is a spindle of the front wheel 66 of the conventional tricycle. The spindle has connected thereto a pair of pedals 68 and 70 for providing rotational movement to the spindle and wheel 66. The wheel 66 of course may be the conventional front wheel of the unmodified tricycle. A spring 72 is looped over the tricycle arcuate

body portion 12 and is maintained by a bolt 74 from sliding rearwardly down the body portion. The ends of the spring 72 are connected to the parallel arms 62 and 60 for providing a resilient force on the arms so that the arms tend to pivot clockwise about the bolt 54 as pictured in Figure 1. The spring biasing normally places the wheel 66 in the full line position as shown in Figure 1. However, when a person sitting on the seat 24 applies leg pressure to the pedals 68 and 70, the parallel arms 62 and 60 will tend to limitedly pivot counterclockwise about nut and bolt connection 54 so that the wheel assumes its dotted line position shown in Figure 1 whereby it will contact the ground. Then, by moving the pedals in a counterclockwise direction from the position shown in Figure 1, the structure may be motivated forwardly. A chain 76 is shown wound about the circumference of the wheel 66 for providing greater frictional contact between the ground 78 and the wheel 66. This chain is often necessary in view of the fact that the device is intended to be principally utilized on snow or ice where frictional forces are at a minimum.

Dependingly supported between the bifurcated portions 30 and 32 of fork member 18 as by bolts 80 and 82 and nuts 84 and 86 is a first T-shaped member 88. The member 88 includes bifurcated vertical portions 90 and 92 and has a spacer 95 therebetween. The portions 90 and 92 fit within the portions 30 and 32 and aligned apertures accommodate the bolts 80 and 82. Particularly noting Figure 4, it may be seen that a vertical series of aligned apertures are shown as at 94, 96 and 98. This series of apertures is provided so that the bifurcated portions 90 and 92 may be adjustably supported by bolts 80 and 82 between the bifurcations 30 and 32 of fork member 18. Integrally supported with the bifurcated portions 90 and 92 is a cross member 100 which is arcuately inclined toward its forward end and further has an aperture 102 therein. This aperture 102 is adapted to be aligned with apertures 104 in a pair of ears 106 welded to a first runner 108 having an inclined forwardly extending portion 110. A bolt 112 is accommodated between apertures 102 and 104 and is maintained in place by a nut 114. A pivotal connection is thereby provided between the cross member 100 and the runner 108. The cross member 100 acts to limitedly confine the pivotal movement of runner 108 about the axis defined by bolt 112.

A pair of collars 116 and 118 are fixed to the rear axle by cotter pins 120 and 122 which pass through aligned apertures in the collars 116 and 118 and the rear axle 34. The collars 116 and 118 pass through apertures in the vertical portions 124 and 126 of a second and a third T-shaped member respectively. The collars 116 and 118 are welded to the vertical portions 124 and 126. It should be apparent that the rear axle 34 may rotate relative to the cross member 28, thereby allowing the vertical portions 124 and 126 of the second and third T-shaped members to rotate relative to the cross member 28. As was defined for the first T-shaped member, the second and third T-shaped members include cross portions 130 and 132 which have apertures which are adapted to be aligned with apertures through pairs of ears 134 and 136. Bolts 138 and 140 are adapted to pass through these aligned apertures and are secured in place by nuts 142 and 144, whereby a pivotal connection is established between the cross members of the T-shaped members and the ear pairs 134 and 136 respectively. The ear pairs are in turn welded to runners 146 and 148 in a manner identical to the relationship shown between the ear pair 106 and runner 108.

In summation, in the utilization of this device, a person sitting on the saddle seat 24 will apply a downward force on the pedals 68 and 70 thereby pivoting the parallel arms 62 and 60 about the pivotal axis 54, 56 against the resilient force of spring 72 and so bring the wheel 66 and chain 76 in contact with the ground, snow or ice 78. A rotational movement of the pedals 68 and 70 will motivate the device comprising this invention along the ground and as soon as a sufficient speed is established, the force on pedals 68 and 70 may be released and the resiliency of spring 72 will return the arms 62 and 60 about the pivotal axis 54, 56 to a position where the wheel 66 will no longer contact the ground. However, the established speed of the device will enable the invention to remain in motion as the runners 108, 146 and 148 slide over the snow or ice. It is to be noted that an undulation in the snow at the forward portion of the modified tricycle, will force the runner 108 to pivot limitedly about the axis defined by bolt 112 while not affecting the general stability of the modified tricycle. Likewise, undulations at the rear runners enable them to pivot about axes defined by the bolts 140 and 138 so as not to affect the general horizontal level of the seat 24. Still further, when the converted tricycle approaches a hill, the body portion 12 may virtually pivot about the rear axle 34 relative to the rear runners 146 and 148. It is apparent then that the described device is a stable structure capable of safely providing entertainment and enjoyment for children.

It is to be noted that it is within the contemplation of this invention to utilize the teachings disclosed above in adaptation kits for converting conventional tricycles to modified devices capable of use on snow or ice and further to utilize the teachings for the production of complete models particularly built for snow and ice use.

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 as claimed.

What is claimed as new is as follows:

1. In combination with a conventional tricycle frame including a body portion, a steering column, and a cross member fixedly carried by said body portion, a yoke including a pair of spaced members fixed to said cross member, a pair of parallel arms pivotally and terminally carried by said spaced members, a driving wheel rotatably supported between said parallel arms, a spring vertically suspended from said body portion terminally attached to said parallel arms, pedal means for rotating said wheel, a plurality of longitudinally extending runners supported from said frame, a first rigid T-shaped member dependingly supported from said steering column, a first of said plurality of runners pivotally carried by said first T-shaped member, a rear axle rotatably supported by said cross member, second and third rigid T-shaped members dependingly terminally carried by said axle, a second and a third of said plurality of runners pivotally carried by said second and third T-shaped members, each of said T-shaped members including a vertical portion and a longitudinally extending cross portion, said cross portion being inclined toward its forward end, said T-shaped members being dependingly positioned in a vertical plane, each of said runners being horizontal and having a pair of spaced upstanding parallel ears rigidly attached thereto, said cross portions being received between said ear pairs and pivotally retained therein perpendicular to said runners whereby said cross portions permit only limited pivotal movement of said runners toward said inclined forward ends.

2. In combination with a conventional tricycle frame including a body portion, a steering column, and a cross member fixedly carried by said body portion, a yoke including a pair of spaced members fixed to said cross member, a pair of parallel arms pivotally and terminally carried by said spaced members, a driving wheel rotatably supported between said parallel arms, a spring vertically suspended from said body portion terminally attached to said parallel arms, pedal means for rotating

said wheel, a plurality of longitudinally extending runners supported from said frame, a first rigid T-shaped member dependingly supported from said steering column, a first of said plurality of runners pivotally carried by said first T-shaped member, a rear axle rotatably supported by said cross member, second and third rigid T-shaped members dependingly terminally carried by said axle, a second and a third of said plurality of runners pivotally carried by said second and third T-shaped members, each of said T-shaped members including a vertical portion and a longitudinally extending cross portion, said cross portion being inclined toward its forward end, said T-shaped members being dependingly positioned in a vertical plane, each of said runners being horizontal and having a pair of spaced upstanding parallel ears rigidly attached thereto, said cross portions being received between said ear pairs and pivotally retained

therein perpendicular to said runners whereby said cross portions permit only limited pivotal movement of said runners toward said inclined forward ends, and means carried on said wheel to frictionally engage ice and snow.

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