United States Patent [19]

Newman

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[45] **Apr. 17, 1973**

[54] **SNOWMOBILE CONSTRUCTION**

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[73] Assignee: **Rupp Industries, Inc.**, Mansfield, Ohio

[22] Filed: **Sept. 27, 1971**

[21] Appl. No.: **183,777**

[52] **U.S. Cl.** ..... **180/5 R**, 305/24

[51] **Int. Cl.** **B62d 27/02**

[58] **Field of Search** ..... 180/5, 9.24 R, 9.24 A, 180/9.54; 305/24, 25

[56] **References Cited**

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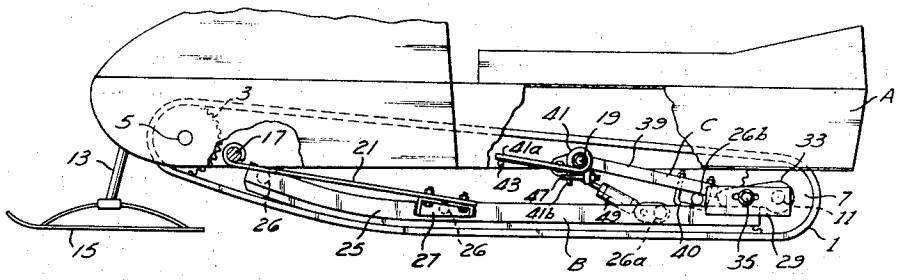
Primary Examiner—Richard J. Johnson

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[57] **ABSTRACT**

A structure for resiliently supporting the body of a snowmobile including an endless track, slides engaging the track and connected to the frame for limited arcuate movement and spring means controlling such arcuate movement.

4 Claims, 11 Drawing Figures



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SHEET 1 OF 3

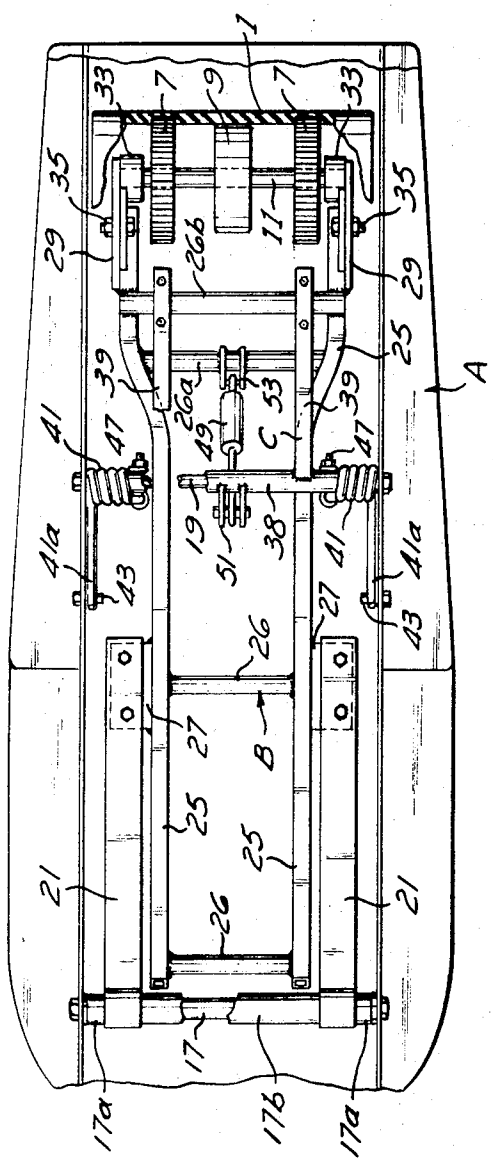


Fig. 2

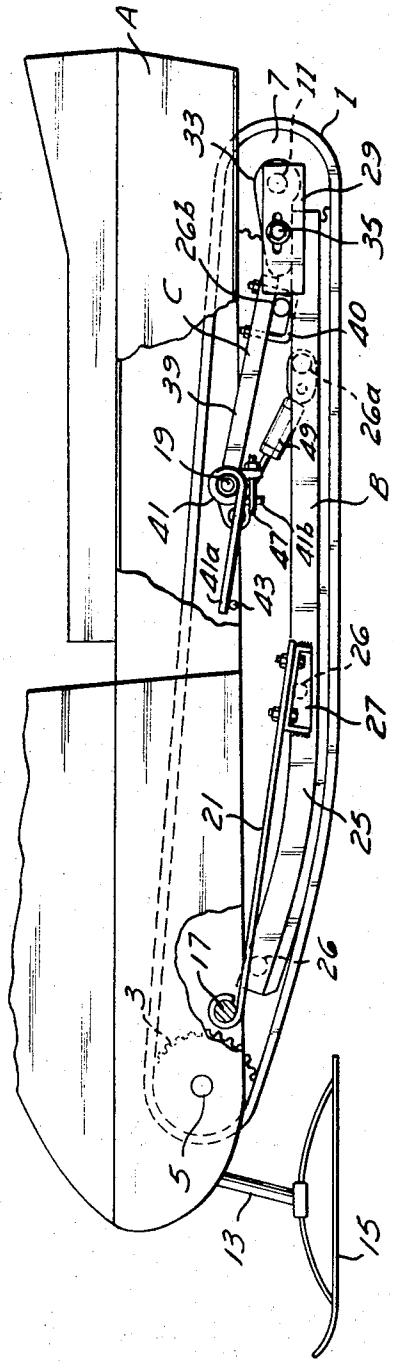


Fig. 1

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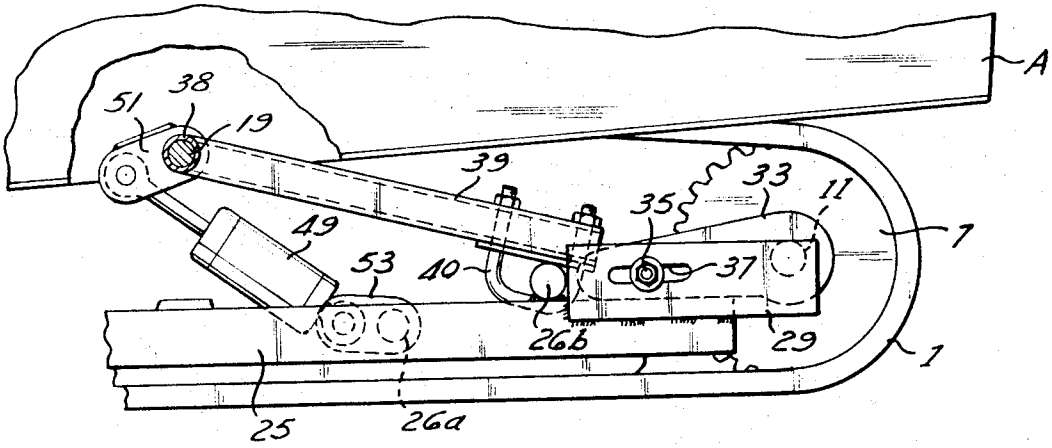


Fig. 3

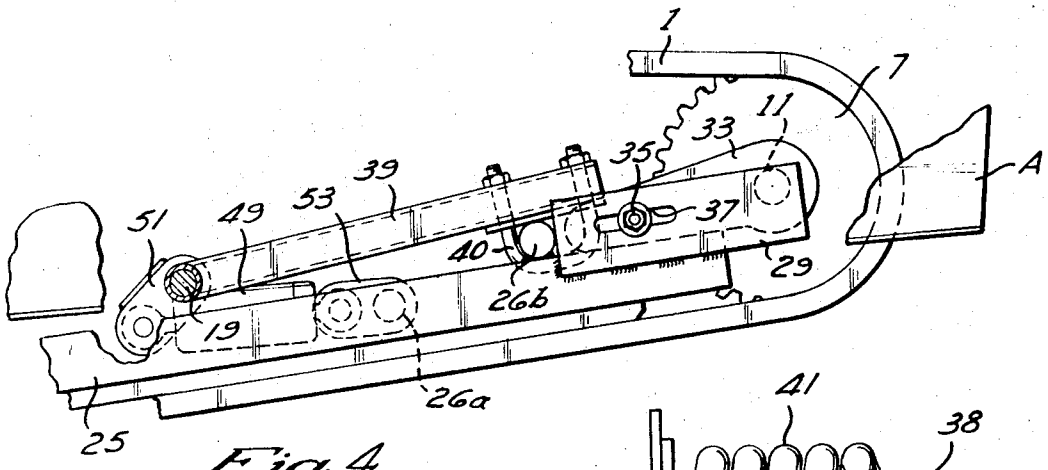


Fig. 4

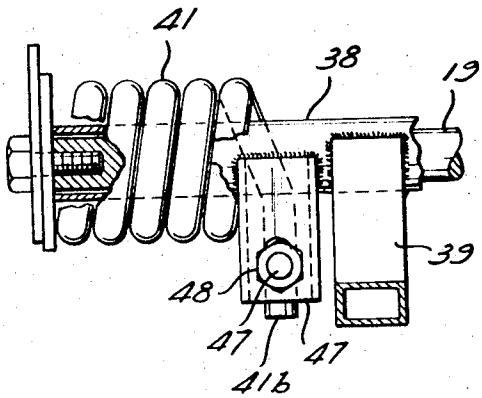


Fig. 5

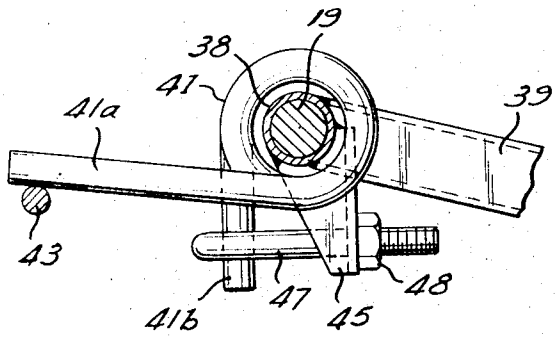


Fig. 6

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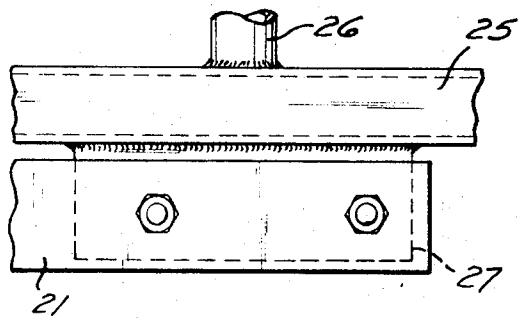


Fig. 7

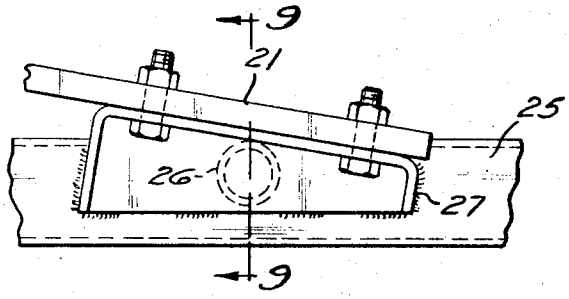


Fig. 8

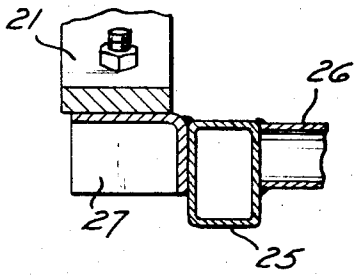


Fig. 9

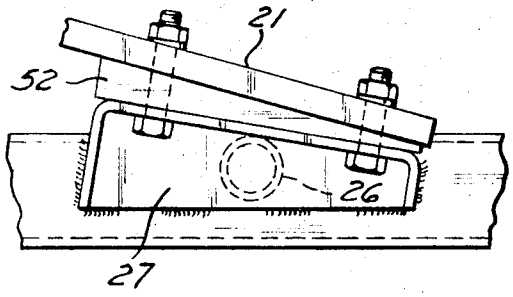


Fig. 10

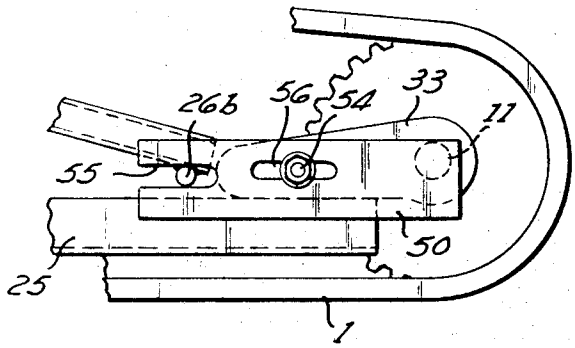


Fig. 11

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SNOWMOBILE CONSTRUCTION

BACKGROUND

So far as I am aware, the patent to Swenson, U.S. Pat. No. 3,485,312 is the prior art most nearly pertinent to the present invention.

The frame supporting system of that patent is cumbersome and expensive in that is includes a considerable number of unnecessary and costly parts.

SUMMARY

The present invention provides a simplified structure consisting of a few, comparatively inexpensive, parts for resiliently supporting the frame of a snowmobile and for controlling the movement of the track-engaging slides.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings accompanying and forming a part of this specification:

FIG. 1 is a partly schematic, side elevational view of a snowmobile supported by a simplified structure embodying the present invention;

FIG. 2 is a top plan view of the apparatus of FIG. 1 with parts removed and others partly in section;

FIG. 3 is a side view of the rear portion of the apparatus of FIG. 1 indicating the relative positions of the slides and snowmobile frame in one extreme position;

FIG. 4 is a view similar to FIG. 3 but with the same parts in the other extreme position;

FIG. 5 is a fragmentary top plan view, partly in section, of the means for controlling the movements of the track-engaging slides;

FIG. 6 is a side elevational view of the parts shown in FIG. 5;

FIG. 7 is a fragmentary, top plan view of the means for controlling the movement of the front portion of the track-engaging slides;

FIG. 8 is a side elevational view of the structure shown in FIG. 7;

FIG. 9 is a cross sectional view, partly in elevation, taken on line 9—9 of FIG. 8;

FIG. 10 is a view similar to FIG. 8 but showing means for varying the movement of the front portion of the slides; and

FIG. 11 is a side elevational view, partly in section, of a modification of the means shown in FIGS. 3 and 4 for connecting the snowmobile frame to the rear end portion of the track-engaging slides.

A preferred embodiment of the present invention is illustrated in FIGS. 1–9 of the drawings. Therein A designated the frame of a snowmobile which is U-shaped in cross section with the open side facing downwardly, B designates a slide assembly and C designates means for controlling the movements of the frame and slide assembly relative to one another.

Frame A is equipped with an endless track 1 which is driven by one or more sprockets 3 mounted on a transverse shaft 5 near the forward end of the frame. In its rear portion, track 1 engages sprockets 7 and roll 9 which are mounted on a transverse shaft 11 supported by means about to be described. In FIG. 1 the front part of frame A is provided with engine means (not shown) for rotating shaft 5 and thereby driving track 1, and column 13 extends downwardly from a steering wheel

(not shown) to conventional skis 15 for steering the snowmobile.

Rods 17 and 19 extend transversely across the forward end and the intermediate part of the frame near the lower edge of the sides of the latter.

Slide assembly B (see FIGS. 1 and 2) is positioned within track 1 and includes leaf springs 21, shoes 25 which are positioned to bear against the inner surface of the lower run of track 1, transverse rods 26, 26*a* and 26*b* and brackets 27 fixed to the shoes. The front ends of springs 21 are rotatable on rod 17, and are spaced from frame A by short spacers 17*a* and are spaced apart by long spacer 17*b*. The rear ends of springs 21 are immovably connected to brackets 27. The slide assembly also includes vertical wear plates 29 connected to the rear ends of shoes 25, as by welding. Bearing brackets 33 lie against wear plates, carry shaft 11 on which sprockets 7 and pulley 9 are mounted and are securable in adjusted positions by bolts 35 extending through holes in the brackets and plates. Rod 26*b* connects the shoes together adjacent to the forward end of plates 29. That assembly also includes shaft 11 with its sprockets 7 and pulley 9 and brackets 33 in which rod 11 is rotatably mounted. Brackets 33 bear on the upper surface of shoes 25, lie against the sides of plates 29 and are adjustable longitudinally by bolts 35 positioned in the slots 37 of plates 29.

A rigid member (FIGS. 5 and 6) consisting of tube 38 rotatable on cross rod 19 and rearwardly extending arms 39 connects the frame A with the slide assembly. The arms 39 have U bolts 40 at their rear ends which loosely receive rod 26b and thereby provide a lost motion connection between the arms and slide assembly.

Means are provided for resiliently controlling the relative movement of the frame A and the slide assembly B (see FIGS. 5 and 6). That means includes the leaf springs 21 above described. It also includes coil springs 41 which encircle rod 19 and tube 38 near the ends thereof and bear at their forward ends 41*a* on stops 43 carried by the frame and at their other ends 41*b* are connected to a tension adjusting means. That means includes brackets 45 fixed to tube 38 of the rigid member and adjusting eye bolts 47 which receive the ends 41*b* of springs 41 and nuts 48 on the eye bolts. It will be understood that when the eye bolts 47 exert pull on the ends 41*b* of spring 41 the forward ends 41*a* of those springs will bear against pins 43 and the rear end of arms 39 the rigid member will be urged toward the slide assembly B; and that when the slide assembly and the frame A move toward or away from one another, their movements will be controlled by the leaf springs 21 and the coil springs 41.

FIGS. 3 and 4 illustrate extreme positions of the rear portion of the track and of the slide assembly and associated parts. In FIG. 3 the rear part of the slide assembly is in its extreme down position, i.e., away from frame A while in FIG. 4 the rear portion of the slide assembly is in its uppermost position relative to the frame. In FIG. 3 transverse rod 26*b* is in its rearmost position in U bolts 40 while in FIG. 4 rod 26*b* is in its forwardmost position in the U bolts. By reason of this lost motion connected between the rigid member and the slide assembly the inclination of rigid member arms 39 may vary with resultant actual or limited arcuate movement of the slide assembly about rod 17 as a pivot.

If desired, shock absorbing means may be provided to impede excessive relative movement of the frame and slide assembly. Such shock absorbing means is shown in FIGS. 1–3 where the shock absorber **49** is connected at one end to mounts **51** on tube **38** of the rigid member and at the other end to mounts **53** on transverse rod **26***a* connected to the shoes **25**.

A modification of the mountings for the rear ends of springs **21** is shown in FIG. **10**. There wedges **52** are disposed between spring **21** and brackets **27** with the thickest portion of the wedge being forward but it will be understood that the wedge may be reversed, thereby placing the thinner edge of the wedge in the forward position. The effect of using the wedges **52** is that the position of the forward ends of the slides may be depressed a small amount with the thin edges of the wedges facing forward and a greater amount with the thick edges of the wedges facing forward.

FIG. **11** shows a modification of the connection between the rear portion of the slide assembly and the rigid member cooperating therewith. In this modification, vertical wear plates **50** are secured against the sides of the rear ends of shoes **25**, as by welding, and are provided with open ended horizontal slots **55** at their forward ends to receive cross rod **26***b* slidably. Bearing brackets **33** are held in adjusted position by bolts **54** in closed horizontal slots **56**.

From the foregoing description and the drawings, it will be seen that the embodiment of the present invention disclosed herein is simple in construction and consists of a small number of relatively inexpensive parts. The slide assembly consists of shoes **25** connected together by cross rods **26**, **26***a* and **26***b*, these parts being of simple construction and readily connectible together as by welding. This slide assembly includes adjustable means for carrying the shaft on which the rear sprockets are mounted.

The resilient means for controlling the relative movement of the frame A and the slide assembly include the leaf spring **21** of the slide assembly, the rigid member consisting of tube **38** and arms **39** attached to that tube, a lost motion connection between the rear ends of those arms and cross rod **26***b* and springs **41** which exert force tending to pivot the arms **39** about rod **19** and to move the rear ends of the arms toward the slide assembly.

As FIGS. **1** and **3** indicate, the slide assembly, with the exception of the forward ends of the leaf springs **21** and shoes **25**, is normally positioned below the lower edges of the sides of the frame A. This normal position is also the position where the slide assembly and the frame are at one extreme of their relative movements. In other words, the frame of slide assembly cannot move farther apart than is shown in FIG. **3**. In FIG. **4** the frame and slide assembly are shown in the other extremity of their relative positions. In that figure only the rearmost part of the slide assembly, U bolts **40** and the end portions of shoes **25** are within the frame A and above its lower edges. The relative movement of the frame A and slide assembly B is slightly arcuate due to the fact that the slide assembly moves about the rod **18** which serves as a pivot for the forward ends of springs **21**. This pivotal movement is controlled by the rigid member consisting of tube **38** and rods **39** and associated parts and springs **41**. This pivotal movement is illustrated in FIGS. **3** and **4**.

Having thus described this invention in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains to make and use the same, and having set forth the best mode contemplated of carrying out this invention, I state that the subject matter which I regard as being my invention is particularly pointed out an distinctly claimed in what is claimed, it being understood that equivalent or modifications of, or substitutions for, parts of the above specifically described embodiment of the invention may be made without departing from the scope of the invention as set forth in what is claimed.

What is claimed is:

1. The combination with the frame of a vehicle having an endless track with a lower surface-engaging run, means to attach the track rotatably to the frame and means to propel the track, of a slide assembly engaging the inner side of the lower run of the track, means for connecting the slide assembly to the frame, said means including leaf spring means pivotally connected at one end to the frame and immovably connected at the other end to the forward portion of the slide assembly, and a lost motion connection between the frame and the rearward portion of the slide assembly and permitting limited relative movement of the slide assembly and frame.

2. The combination of elements set forth in claim **1** in which the said means for connecting the frame and slide assembly includes a rigid member pivotally connected at its forward end to said frame and by a lost motion connection to the rear portion of the slide assembly, and spring means engaging the frame and rigid member to urge the rear end of said member toward the slide assembly.

3. The combination of elements set forth in claim **2** in which said rigid member has rearwardly extending arms connected at their rear ends by a lost motion connection to the rear part of the slide, and coil springs pivotally connected to the frame and urging the rear ends of the arms toward the slide.

4. The combination of elements set forth in claim **1** in which wedges are positioned between the rear ends of the leaf springs and the shoes of the slide assembly for adjustably varying the position of the shoes relative to the frame.

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