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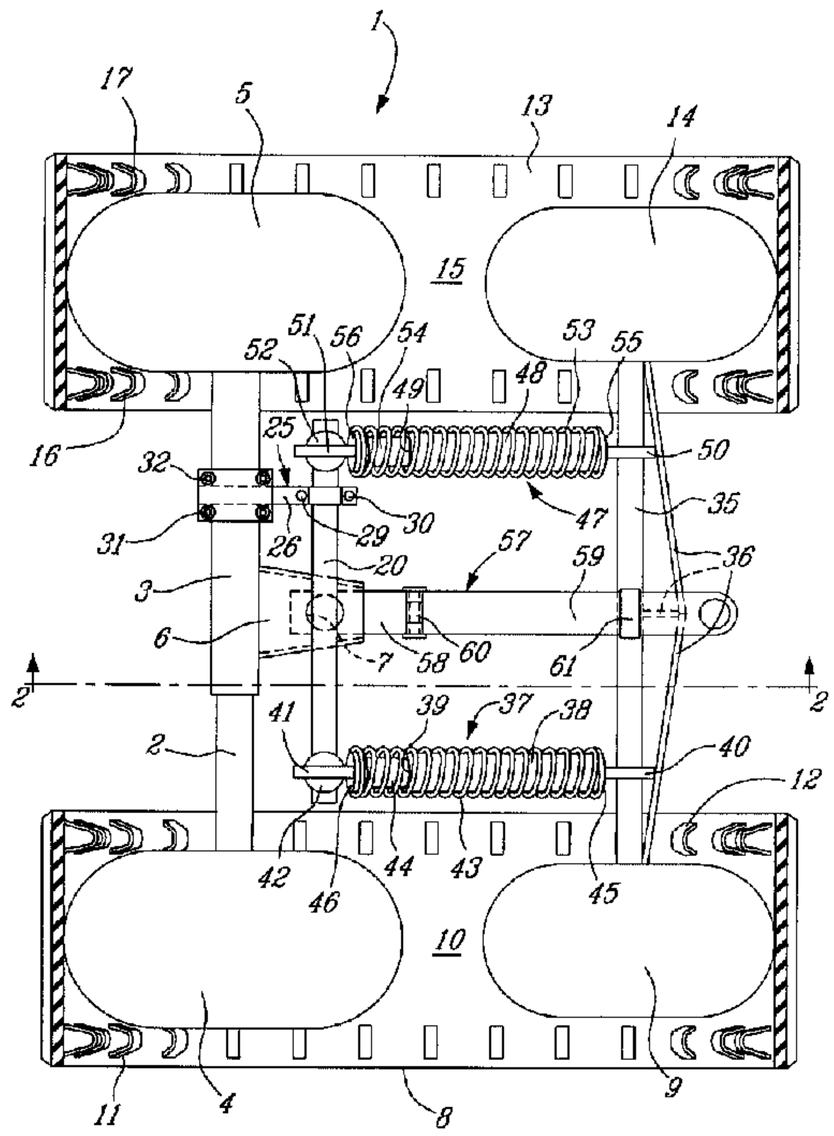
(54) Titre : SYSTEME DE CHENILLE ARRIERE POUR VEHICULE TOUT-TERRAIN DE TYPE MOTO ET A QUATRE ROUES MOTRICES

(54) Title: REAR TRACK SYSTEM FOR FOUR-WHEEL DRIVE MOTORCYCLE-TYPE ALL TERRAIN VEHICLE



(57) Abrégé/Abstract:
The track system is mounted on an all terrain vehicle having a frame, a first transversal rear axle mounted on the frame, and left and right first rear wheels rotatively mounted on the left and right ends of the first transversal rear axle, respectively. The track system comprises a second transversal rear axle, left and right second rear wheels, a left track, a right track, and a telescopic compression-spring-biased arm assembly. The left and right second rear wheels are rotatively mounted on the respective left and right ends of the second transversal rear axle, and are located behind the respective left and right first rear wheels. The left track is mounted on both the left first rear wheel and the left second rear wheel, and the right track is mounted on both the right first rear wheel and the right second rear wheel. Finally, the telescopic compression-spring-biased arm assembly is interposed between the frame and the second transversal rear axle, and is pivotally connected to the frame about a transversal pivot axis located above a plane in which both the first and second transversal rear axles are lying.

ABSTRACT OF THE DISCLOSURE

The track system is mounted on an all terrain vehicle having a frame, a first transversal rear axle mounted on the frame, and left and right first rear wheels rotatively mounted on the left and right ends of the first transversal rear axle, respectively. The track system comprises a second transversal rear axle, left and right second rear wheels, a left track, a right track, and a telescopic compression-spring-biased arm assembly. The left and right second rear wheels are rotatively mounted on the respective left and right ends of the second transversal rear axle, and are located behind the respective left and right first rear wheels. The left track is mounted on both the left first rear wheel and the left second rear wheel, and the right track is mounted on both the right first rear wheel and the right second rear wheel. Finally, the telescopic compression-spring-biased arm assembly is interposed between the frame and the second transversal rear axle, and is pivotally connected to the frame about a transversal pivot axis located above a plane in which both the first and second transversal rear axles are lying.

REAR TRACK SYSTEM FOR FOUR-WHEEL DRIVE MOTORCYCLE-TYPE ALL TERRAIN VEHICLE

BACKGROUND OF THE INVENTION

1. Field of the invention:

The present invention relates to a rear track system for four-wheel drive all terrain vehicle (ATV).

2. Brief description of the prior art:

It is well known to those of ordinary skill in the art that the four-wheel drive motorcycle-type ATV's presently available on the market run with difficulty in thick snow during winter. The same difficulty is encountered in deep mud.

OBJECT OF THE INVENTION

An object of the present invention is therefore to provide a rear track system for enabling an ATV to easily run into thick snow, deep mud, etc.

SUMMARY OF THE INVENTION

More specifically, in accordance with the present invention, there is provided a track system for an all terrain vehicle having a frame, a first transversal rear axle mounted on the frame, and left and right first rear wheels rotatively mounted on the left and right ends of the first transversal rear axle, respectively. The track system comprises a second transversal rear axle, left and right second rear wheels, a left track, a right track, and a telescopic compression-spring-biased arm assembly. The left and right second rear wheels are rotatively mounted on the respective left and right ends of the second transversal rear axle, and are located behind the respective left and right first rear wheels. The left track is mounted on both the left first rear wheel and the left second rear wheel, and the right track is mounted on both the right first rear wheel and the right second rear wheel. The telescopic compression-spring-biased arm assembly is interposed between the frame and the second transversal rear axle, and is pivotally connected to the frame about a transversal pivot axis located above a plane in which both the first and second transversal rear axles are lying.

The objects, advantages and other features of the present invention will become more apparent upon reading of the following non restrictive description of a preferred embodiment thereof, given by way of example only with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the appended drawings:

Figure 1 is a top plan view of a track system in accordance with the present invention; and

Figure 2 is a side elevational view of the track system of Figure 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figures 1 and 2, the track system is generally identified by the reference 1.

Still referring to Figures 1 and 2, a conventional four-wheel drive motorcycle-type ATV comprises:

- a rear axle 2 rotatively mounted about its longitudinal axis in a transversal tubular member 3 fixedly welded to the frame (not shown) of the ATV;

- a pair of left 4 and right 5 rear wheels mounted at the respective ends of the axle 2; and

- a drawbar 6 with a vertically extending hole 7 therein, the drawbar 6 being fixedly welded to the frame, including the transversal tubular member 3, of the ATV.

The track system 1 comprises a left track 8 mounted for rotation on the left rear wheel 4 of the ATV and an additional left wheel 9 of the track system 1, located behind rear wheel 4. The inner face 10 of the left track 8 is provided with a left series of generally triangular track holders such as 11, and a right series of generally triangular track holders such as 12. It is apparent that the left 11 and right 12 holders will prevent lateral movement of the left track 8 on the left wheels 4 and 9 to maintain this track 9 on these wheels 4 and 9.

The track system 1 also comprises a right track 13 mounted for rotation on the right rear wheel 5 of the ATV and an additional right wheel 14 of the track system 1, located behind right rear wheel 5. The inner face 15 of the right track 13 is provided with a left series of generally triangular track holders such as 16, and a right series of generally triangular track holders such as 17. It is apparent that the left 16 and right 17 holders will prevent lateral movement of the right track 13 on the right wheels 5 and 14 to maintain this track 13 on these wheels 5 and 14.

According to a non limitative preferred embodiment, the left 8 and right 13 tracks will present the same configuration, design and structure as the snowmobile tracks, including spikes such as 18 on the outer surface 19 thereof.

The track system 1 further comprises:

- a transversal front axle 20 parallel to both the axle 2 and transversal tubular member 3 of the ATV, and comprising:

a bolt 21 extending perpendicular to the front axle 20, and having a head 22 fixedly welded to the front axle 20 (see Figure 2) and a threaded rod 23 inserted in the hole 7 with the head 22 on the upper side of the drawbar 6; and

a nut 24 engaged on the threaded rod 23 on the lower side of the drawbar 6 and tightened to fixedly secure the transversal front axle 20 to the frame of the ATV through the drawbar 6;

- a stabilizing tie member 25 comprising:

a flat bar 26 extending between the transversal front axle 20 of the track system 1 and the transversal tubular member 3 on one side of the drawbar 6 at a given distance from this drawbar to stabilize the position of axle 20 with respect to the position of the tubular member 3;

a clamping device formed by one end section 27 of the flat bar 26 defining a transversal semicylindrical seat to receive the front axle 20, and a complementary flat bar section 28 with a transversal semicylindrical seat to receive the front axle;

a pair of bolt-and-nut assemblies 29 and 30 for tightening the flat bar sections 27 and 28 on the transversal front axle 20;

a pair of rectangular plates 33 and 34 each having a set of four holes; and

a pair of U-bolts 31 and 32 positioned on the transversal tubular member 3 and having:

respective pairs of threaded end rod sections inserted in corresponding holes of both plates 33 and 34; and

respective pairs of nuts engaging the corresponding threaded end rod section to tighten the adjacent end section of the flat bar 26 between the two plates 33 and 34;

- a transversal rear axle 35 parallel to the transversal front axle 20, and to the transversal rear axle 2 and tubular member of the ATV, and having:

two opposite ends on which the respective wheels 9 and 14 are rotatively mounted; and

reinforcing bridge members 36 to reinforce the transversal rear axle 2;

- a left telescopic spring-biased member 37 perpendicular to both the axles 20 and 35 to interconnect the left end sections of these two axles, this left telescopic spring-biased member 37 comprising:

a rear tube 38 of larger diameter having a front open end 39 and a rear end fixedly and perpendicularly welded to the transversal rear axle 35 through a section of bar 40;

a front tube 44 of smaller diameter slidably and telescopically mounted in the rear tube 38 through the open end 39 thereof, this front tube 44 having a front end mounted to the transversal front axle 20 through a

section of bar 41 fixedly welded to this front end of tube 44;

a flexible ball joint 42 between the bar section 41 and the transversal front axle 20;

a coil spring 43 coaxially mounted on the telescopic tubes 38 and 44, and having front and rear ends;

a rear spring holder 45 secured to the rear end of tube 38 to hold and axially center the rear end of coil spring 43; and

a front spring holder 46 secured to the front end of tube 44 to hold and axially center the front end of coil spring 43, the front spring holder 46 also serving as a stopper for the open front end 39 of rear tube 38; and

- a right telescopic spring-biased member 47 perpendicular to both the axles 20 and 35 to interconnect the right end sections of these two axles, this right telescopic spring-biased member 47 comprising:

a rear tube 48 of larger diameter having a front open end 49 and a rear end fixedly and perpendicularly welded to the transversal rear axle 35 through a section of bar 50;

a front tube 54 of smaller diameter slidably and telescopically mounted in the rear tube 48 through the open end 49 thereof, this front tube 54 having a front end mounted to the transversal front axle 20 through a section of bar 51 fixedly welded to this front end of tube 54;

a flexible ball joint 52 between the bar section 51 and the transversal front axle 20;

a coil spring 53 coaxially mounted on the telescopic tubes 48 and 54, and having front and rear ends;

a rear spring holder 55 secured to the rear end of tube 38 to hold and axially center the rear end of coil spring 53; and

a front spring holder 56 secured to the front end of tube 54 to hold and axially center the front end of coil spring 53, the front spring holder 56 also serving as a stopper for the open front end 49 of rear tube 48.

Finally, the track system 1 comprises an extension 57 of the drawbar 6 to enable the ATV to still hitch and pull equipments such as a trailer. Drawbar extension 57 comprises front 58 and rear 59 drawbar sections pivotally connected end-to-end through a hinge 60. The front drawbar section 58 is fixedly secured to the underside of drawbar 6 through the bolt-and-nut assembly 21,24. Regarding drawbar section 59, it is retained onto the rear axle 35 by means of a tubular member 61 rectangular in cross section and welded to the axle 35. Tubular member 61 enables longitudinal sliding of the drawbar section 59 about axle 35. A conventional hitch ball 62 can finally be mounted on the free rear end 63 of the drawbar section 59.

Operation of the track system 1 will now be described.

The coil springs 43 and 53 normally operates in compression to tension both the tracks 8 and 13. Accordingly, normal

rotation of the rear wheels 4 and 5 of the ATV will cause at the same time rotation of the tracks 8 and 13 and additional wheels 9 and 14. During such rotation, the generally triangular track holders 11, 12 and 16, 17 will maintain both tracks 8 and 13 on their respective wheels 4, 9 and 5, 14, respectively.

Of course, rotation of the tracks 8 and 13 will cause movement of the ATV.

As shown in Figure 2, the transversal front axle 20 is located above the plane in which both axles 3 and 35 are lying. Accordingly, compression of the springs 43 and 53 tends to push the transversal rear axle 35 in direction 64 to apply the lower runs such as 65 of the tracks 8 and 13 to the ground to thereby provide improved traction.

During running of the ATV on rugged ground, the transversal rear axle 35 along with the additional wheels 9 and 14 will pivot about the transversal front axle 20 through the left 37 and right 47 telescopic spring-biased members and the left 42 and right 52 flexible ball joints. During such pivoting, the coil springs 43 and 53 will push the transversal rear axle 35 in direction 64 to continuously apply the lower runs such as 65 of the tracks 8 and 13 to the ground thereby continuously providing improved traction. Moreover, as the transversal rear axle 35 and additional wheels 9 and 14 pivot about the transversal front axle 20 in direction 66 (Figure 2), compression of the coil springs 43 and 53 increases to thereby increase the force of application of the lower runs of the tracks 8 and 13 to the ground whereby the traction is correspondingly increased.

It should be pointed out that abutment of the front open ends 39 and 49 of the rear tubes 38 and 48 of larger diameter on the respective front spring holders 46 and 56 will limit pivoting in direction 66 of the transversal rear axle 35 and additional wheels 9 and 14 about the transversal front axle 20. Obviously, this will prevent the tracks 8 and 13 of the ATV to reach and injure the driver of the ATV. Also, upon climbing a slope, such abutment of the front open ends 39 and 49 of the rear tubes 38 and 48 on the respective front spring holders 46 and 56 will limit pivoting of the ATV about the transversal front axle 20 in direction 67 to allow the track system 1 to retain the ATV and prevent the ATV to tip in direction 67.

Although this is not illustrated in the appended drawings, a mechanism is preferably provided to restrict telescopic extension of the tubes 38, 44 and 48,54 to thereby limit pivoting of the transversal rear axle 35 along with the additional wheels 9 and 14 in direction 64 about the transversal front axle 20.

The function of the flexible ball joints 42 and 52 is to enable compression of only one of the springs 43 and 53 when, for example, a rock, a piece of soil, a piece of wood, etc., passes between one of the wheels 4 and 9 and the track 8 or between one of the wheels 5 and 14 and the track 13.

During pivoting of the transversal rear axle 35 along with the additional wheels 9 and 14 about the transversal front axle 20 through the left 37 and right 47 telescopic spring-biased members, the drawbar extension 57 will pivot about hinge 60 and the rear drawbar section 59 will longitudinally slide in the tubular member 61.

Although the present invention has been described hereinabove by way of a preferred embodiment thereof, this embodiment can be modified at will, within the scope of the appended claims, without departing from the spirit and nature of the subject invention.

WHAT IS CLAIMED IS:

1. A track system for an all terrain vehicle having a frame, a first transversal rear axle mounted on said frame and having left and right ends, and left and right first rear wheels rotatively mounted on the left and right ends of the first transversal rear axle, respectively, said track system comprising:

a second transversal rear axle having left and right ends;

left and right second rear wheels rotatively mounted on the left and right ends of the second transversal rear axle, respectively, said left and right second rear wheels being located behind the left and right first rear wheels, respectively;

a left track mounted on both the left first rear wheel and the left second rear wheel;

a right track mounted on both the right first rear wheel and the right second rear wheel; and

a telescopic compression-spring-biased arm assembly interposed between said frame and the second transversal rear axle, said arm assembly being pivotally connected to said frame about a transversal pivot axis located above a plane in which both the first and second transversal rear axles are lying.

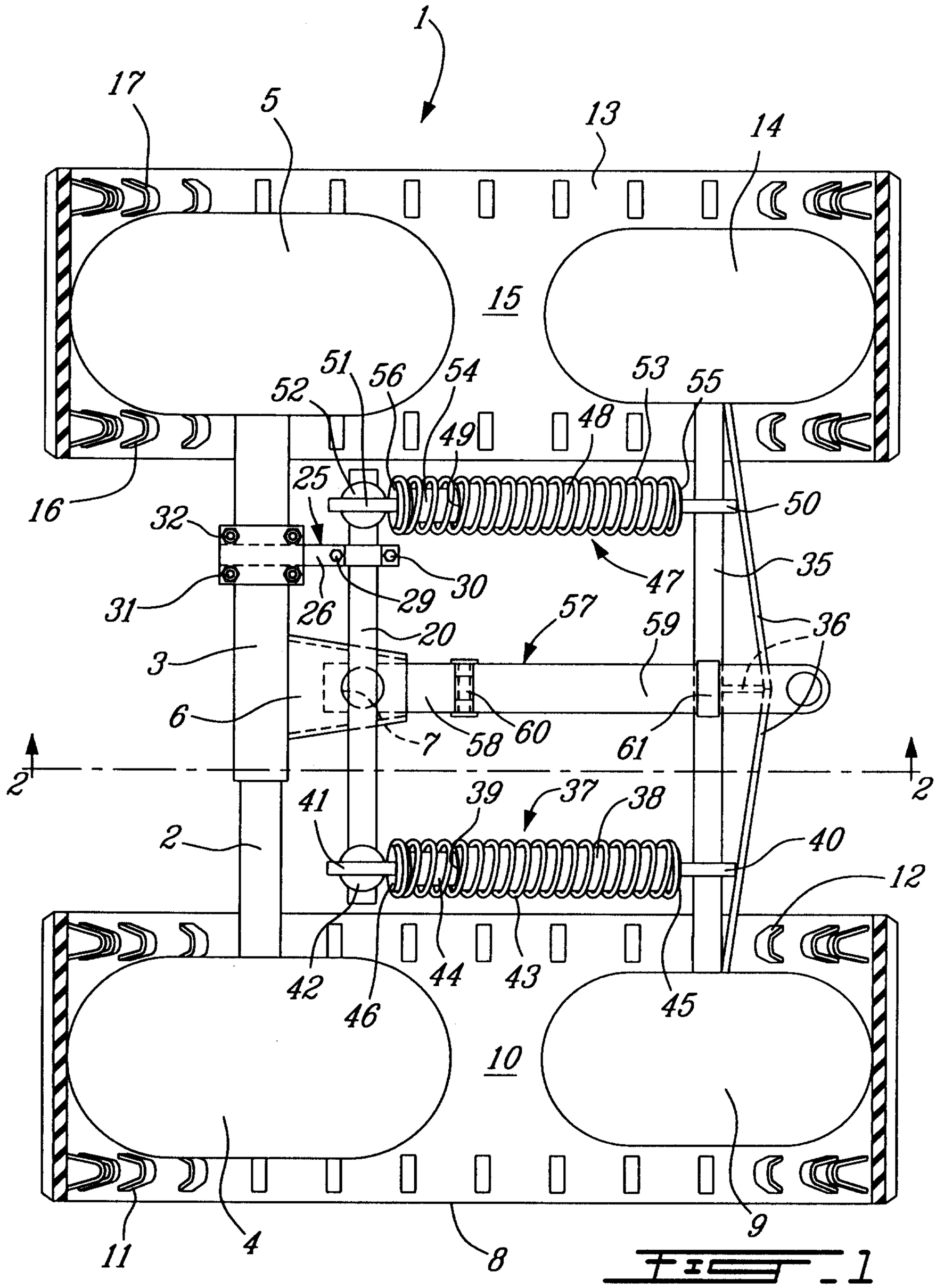

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Fig. 1

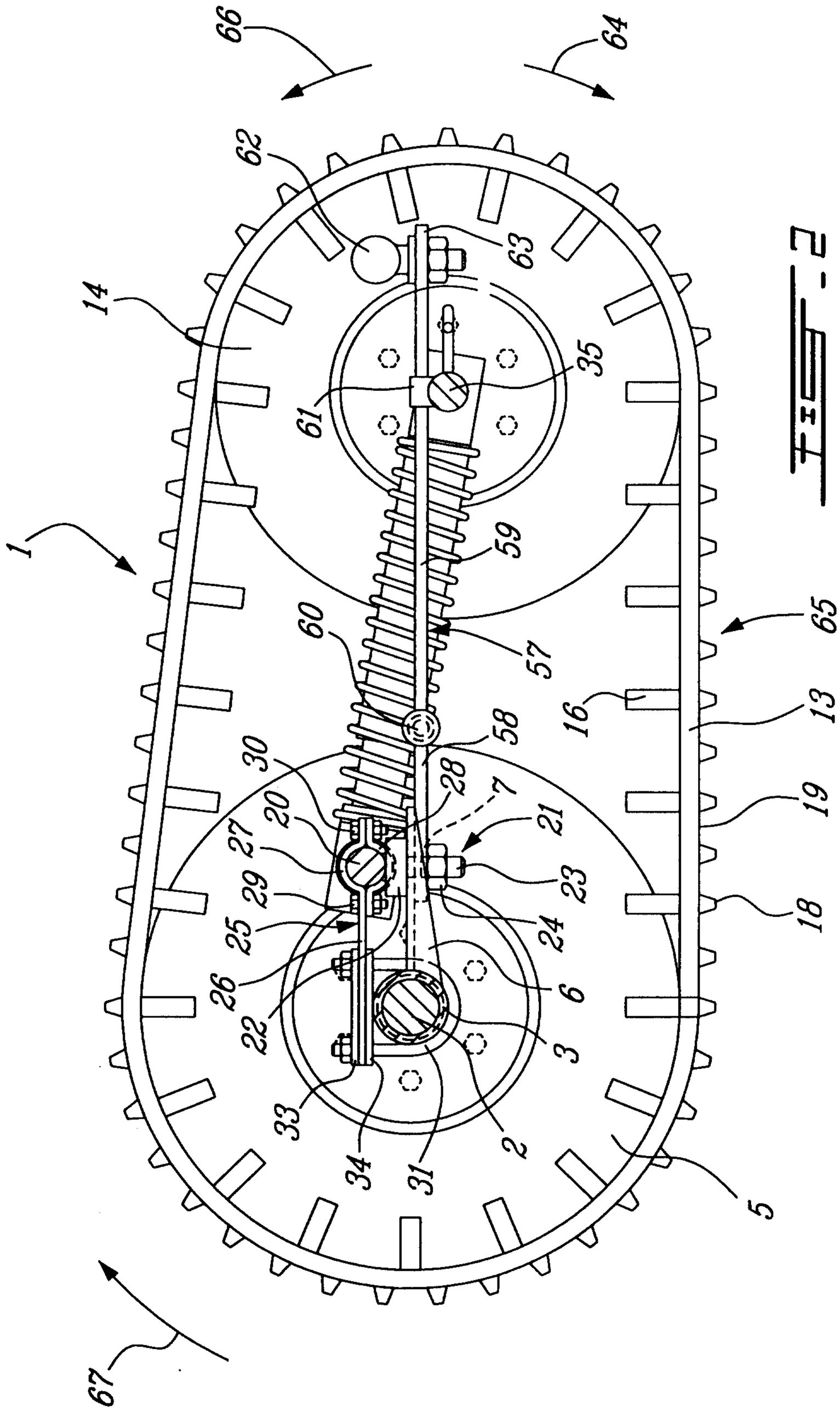
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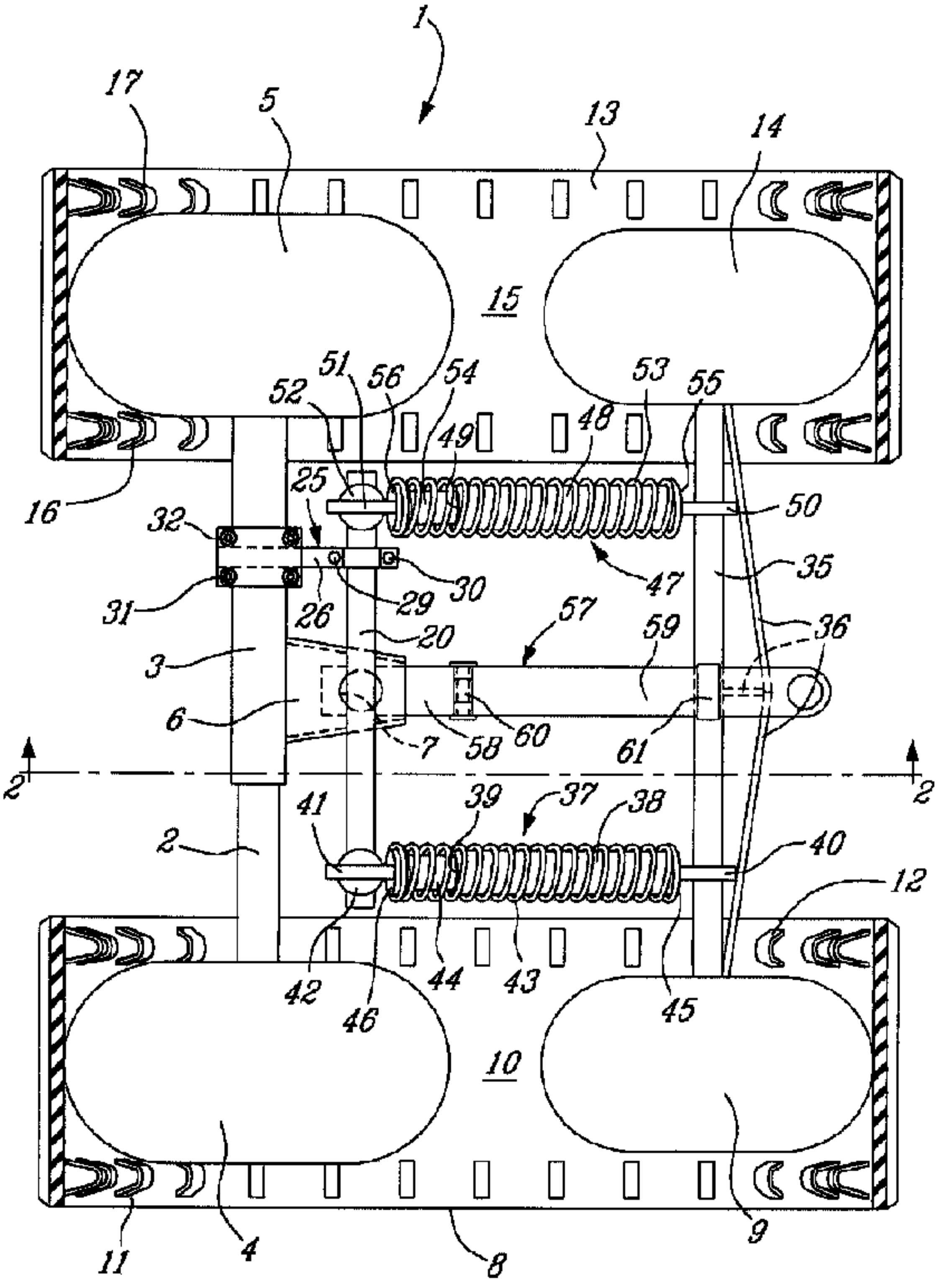
FIG - 2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