April 7, 1964 J. DI PASQUA 3,128,076

TORSION BAR ASSEMBLY FOR MECHANICAL SWING

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Fig. 1

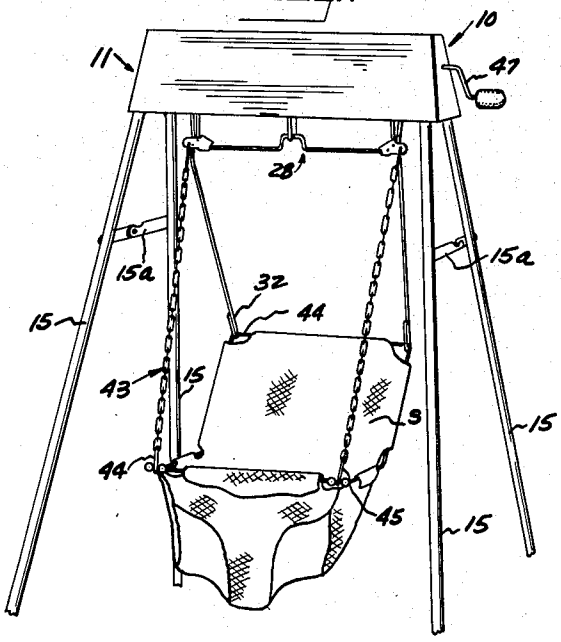
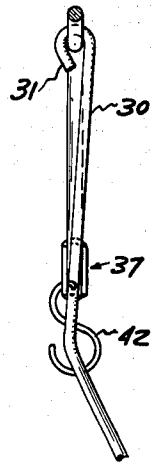


Fig. 3



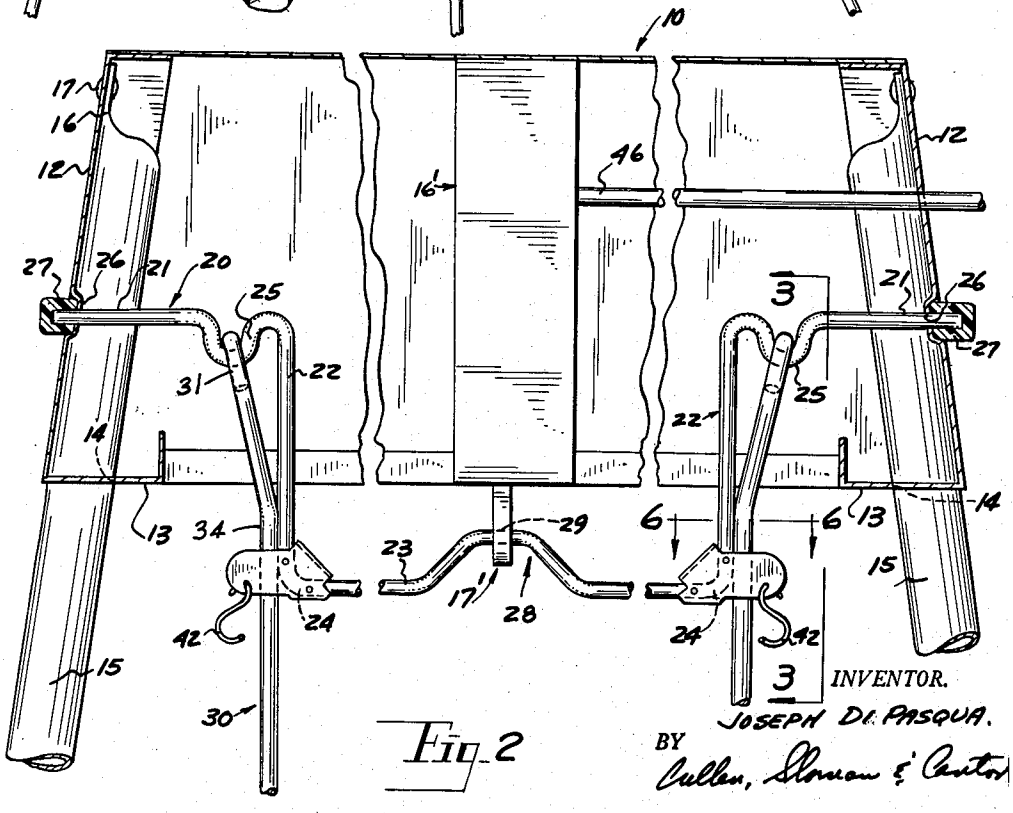


Fig. 2

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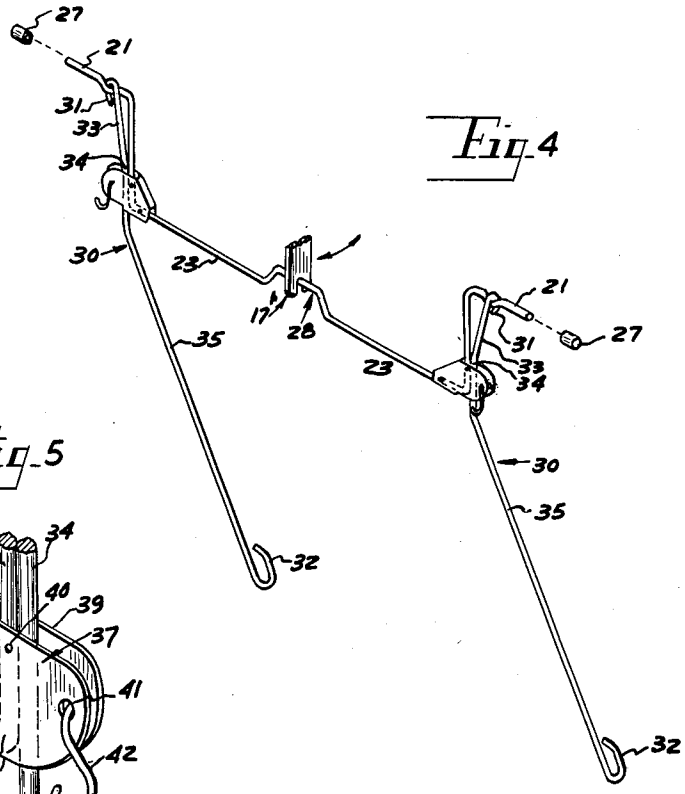
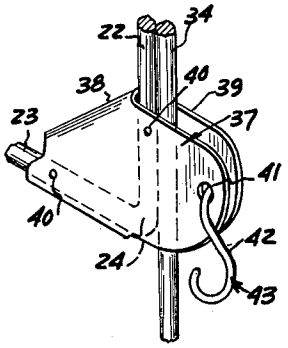


Fig. 4

Fig. 5



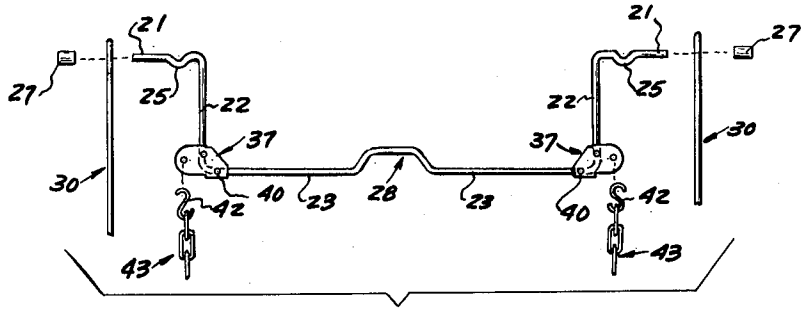
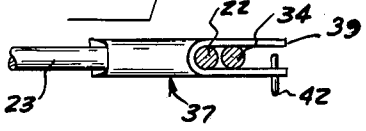


Fig. 7

Fig. 6



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TORSION BAR ASSEMBLY FOR MECHANICAL SWING

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8 Claims. (Cl. 248—370)

This invention relates to a torsion bar assembly for mechanical swings, and more particularly, to a swing suspension for mechanical swings of the type powered by spring motors such as are disclosed in my prior U.S. Patent No. 2,860,727 issued November 18, 1958, and in my United States patent applications Ser. No. 72,442, filed November 29, 1960, now Patent 3,073,416, and Ser. No. 180,070, filed March 12, 1962, now Patent 3,112,814.

This invention is primarily concerned with providing a swing suspension which supports a swing seat, transmits the reciprocal motion of the drive motor to the swing seat to move it forwardly and rearwardly, and restricts sidewise movement of the seat.

One object of this invention is to provide a swing suspension formed of a number of separate parts which are arranged to be easily, and quickly assembled together, to form a rigid assembly, with the parts also being so formed as to permit assembly without the use of any tools.

These and other objects and advantages of this invention will become apparent upon reading the following description of which the attached drawings form a part.

In these drawings:

FIG. 1 is a front perspective view of the entire swing.

FIG. 2 is an enlarged view, partially in cross section, of the upper end of the swing and swing suspension.

FIG. 3 is a view taken in the direction of arrows 3—3 of FIG. 2.

FIG. 4 is a view in perspective, showing the torsion bar assembly or swing suspension, per se.

FIG. 5 is an enlarged, perspective view showing a corner clip connection.

FIG. 6 is a cross-sectional, enlarged view taken in the direction of arrows 6—6 of FIG. 2.

FIG. 7 illustrates the parts of the suspension prior to assembly.

Referring to FIGS. 1 and 2, the swing 10 includes a seat S which may be formed in a chair-like configuration having a wire frame and a cloth seat body. In is suspended from and swings beneath a housing 11 having end support walls 12 whose lower edges are bent inwardly and horizontally to form horizontal flanges 13 provided with slots 14 through which the upper ends of tubular legs 15 are inserted. The upper ends of the legs are flattened as at 16 and pivotally secured by mechanical fasteners 17 to the support walls 12, with the legs thus being in contact with the support walls (see FIG. 2).

Each pair of legs are interconnected by a foldable brace 15*a* so that the legs may be folded towards each other, through slots 14, when the swing is to be stored.

Secured within the housing is a spring motor 16′ of the type disclosed in the above mentioned prior patent and patent applications. This motor has a downwardly depending lever 17′ which is operated by the motor for reciprocation backwards and forwards.

The swing suspension includes a torsion bar 20 formed of stiff rod-like metal which is bent into a shape having end shaft portions 21 and a central, deep, upwardly opening U-shape having legs 22 and a horizontally extending base 23 joined together at relatively sharp corner bends 24. Shallow upwardly opening U-shaped bends 25 are formed in the shaft portions. The free ends of the shaft portions are journaled through sockets or openings 26

formed in the end wall supports 12 and are retained in place by conventional friction end caps 27.

The center part of the base 23 is bent into an inverted U portion 28 which is arranged to pass through an opening 29 formed in the lever 17, thus connecting the lever to the center of the torsion bar.

The torsion bar may be removed from the housing by removing the end caps 27, bending the torsion bar slightly, against the resistance of its inherent springy resilience, pulling it out of the openings 26, and sliding it through the opening 29 in the lever 17. To assemble the bar to the housing the steps are followed in reverse.

The swing suspension also includes upright support rods 30 each having their upper ends bent into a loop 31 which receives the base of the shallow bend 25 in the torsion bar shaft portion 21 and whose lower ends are bent into loops 32 for engaging with the seat S. The upper ends of each of the support rods 30 are bent at an angle to form a brace portion 33, below which is a vertical portion 34 arranged in edge to edge contact with the adjacent respective leg 22 of the torsion bar. The lower portion of the bar is bent downwardly and rearwardly into a swing connecting portion 35.

Each upright support rod 30 is releasably connected to its adjacent torsion bar leg 22 by means of a clip 37 formed of a sheet of flat, springy metal bent into channel or U-shape having a base portion 38 and a pair of walls 39 which are bent toward each other as shown in FIG. 6. The clip receives the bent corner 24 and is secured to the leg 22 and base 23 by means of spot welds 40 or the like (see FIG. 5). The portion 34 of the support rod 30 is clamped between the walls 39 of the clip by means of the resiliency of the clip legs. Additionally it is locked therein by means of passing the upper link 42 of a suspension chain 43 through an opening 41 formed in one of the legs 39.

The seat S is formed with a wire frame 44 or some similar fastening means to which the lower ends 32 of the support rods and the lower ends or links 45 of the support chains are connected as illustrated in FIG. 1.

In addition, the motor 16 is provided with a wind-up shaft 46 having an outwardly extending handle 47 for winding up the spring in the motor.

In operation, the swing which may be received in knockdown condition, is assembled by first securing the pair of legs in position, and then connecting each of the support rods to the torsion bar and connecting the torsion bar to the end walls 12. Following this, the swing seat S is secured to the lower ends of the support rods and the chains.

Thereafter, by winding the handle 47, the spring motor is wound up to cause the lever 17 to reciprocate forwards and backwards and thus rock the swing forwardly and backwardly.

This invention may be further developed within the scope of the following claims. Accordingly, it is desired that the foregoing description be read as being merely illustrative of an operative embodiment of this invention and not in a strictly limited sense.

I now claim:

1. A swing suspension comprising a horizontally arranged support housing having a pair of spaced apart end wall supports; a horizontally arranged torsion bar made of stiff, rod-like material and having its opposite ends each rotatably connected to one of said end wall supports, the central portion of said torsion bar being bent into an upwardly opening, deep U-shaped whose legs are substantially vertically arranged and whose base is horizontally arranged, with the base and legs joining at relatively sharp bent corners; a motor supported in said housing, the motor having a driven, reciprocating lever extending down-

wardly therefrom and being connected to the center of said base for reciprocating said torsion bar about its rotatably connected ends; a swing having a pair of elongated, upright arranged swing support rods, each arranged adjacent to one of said legs and having its upper end connected to the torsion bar at a point located between the respective leg and torsion bar end and extending downwardly at an angle to the vertical to contact its respective leg just above its connection to said horizontally arranged base, the rods further extending downwardly in contact with its respective leg and then extending further downwardly and having its lower end located at a considerable distance beneath the torsion bar with the lower end being formed with means for connection to said swing; means connecting the upright rods to their respective legs at the bent corners where the legs join said base.

2. A construction as defined in claim 1 and said means for connecting the upright rods to said legs comprising a pair of clips, each formed as a U-shaped channel bent of flat springy metal, the clips each being arranged at one of the bent corners where the legs join said base, and each channel receiving the respective corner and being secured thereto, and also receiving and spring gripping its respective upright rod, and means for closing off the ends of the two channels.

3. A construction as defined in claim 2 and said means for closing off the ends of the channels comprising a pair of chains each having its upper end connected to one of the channels near the open end thereof and each having its lower end extending downwardly and arranged for connection to said swing.

4. A construction as defined in claim 1 and including a shallow, upwardly opening, U-shaped bend formed in the torsion bar between each of said legs and the torsion bar ends adjacent respectively thereto; and a bent loop formed on the upper end of each support rod, the upper ends of each support rod being connected to the torsion bar by means of said loops each being looped around the base of the shallow U-shaped bend located adjacent its respective leg.

5. A swing suspension comprising a pair of horizontally spaced apart support walls; a torsion bar formed of an

elongated rod bent into an upwardly opening U-shape forming a horizontal base and upwardly extending legs joined to the base at relatively sharp corners, the upper ends of each leg being bent into horizontally extending shaft portions whose opposite, free ends are each arranged to be removably journaled in journal openings formed in the support walls; a swing having a pair of support rods each having an upper end removably secured to one of said shaft portions, and a lower end located a considerable distance beneath the torsion bar and each being bent into contact with its adjacent leg at the corner of said leg and means for releasably connecting the rods to the torsion bar at said corners.

6. A construction as defined in claim 5 and said means for connecting the support rods to the torsion bar at said corners comprising a pair of clips, each formed as a U-shaped channel bent of flat springy metal and each arranged at one of said corners and each channel receiving the respective corner and being secured thereto and also receiving and spring gripping its respective upright rod; and means for closing off the ends of the two channels.

7. A construction as defined in claim 6 and said means for closing off the ends of the two channels comprising a pair of chains, each having its upper end connected to one of the channels near the open end thereof and its lower end extending downwardly and arranged for connection to said swing.

8. A construction as defined in claim 6 and including a shallow, upwardly opening U-shape bend formed in the torsion bar between each of said legs and the torsion bar ends adjacent respectively thereto; a bent loop formed on the upper end of each support rod, and the upper ends of each support rod being connected to the torsion bar by means of said loops each being looped around the base of the shallow U-shape bend located adjacent its respective leg.

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