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UNDERCARRIAGE ASSEMBLY FOR A ROCKING CHAIR

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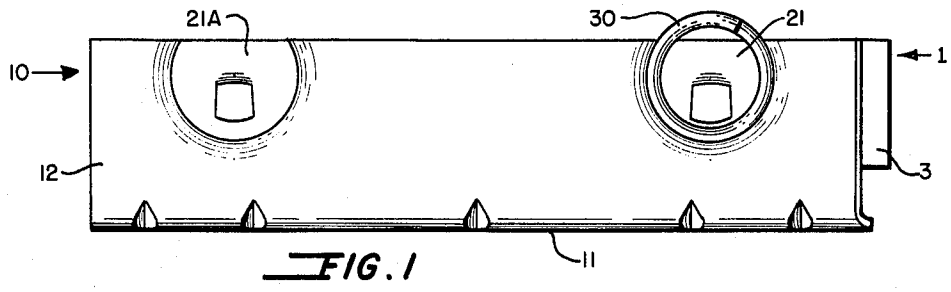


FIG. 1

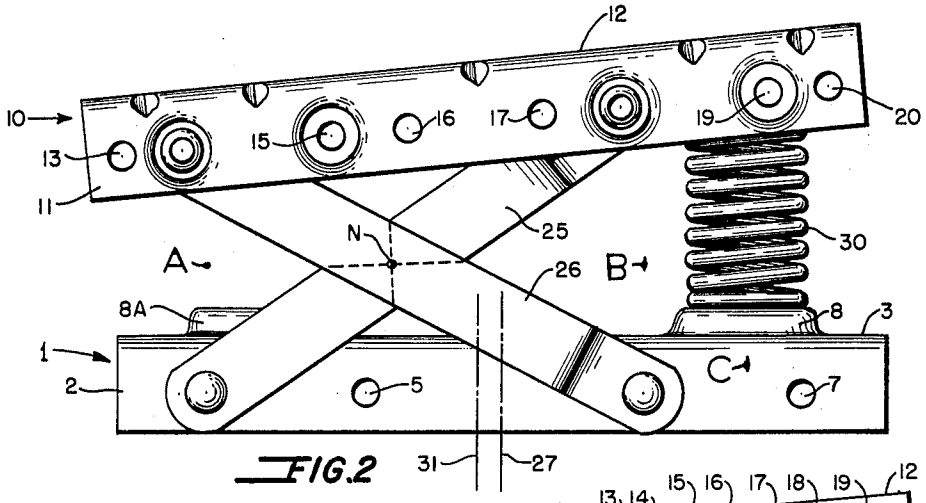


FIG. 2

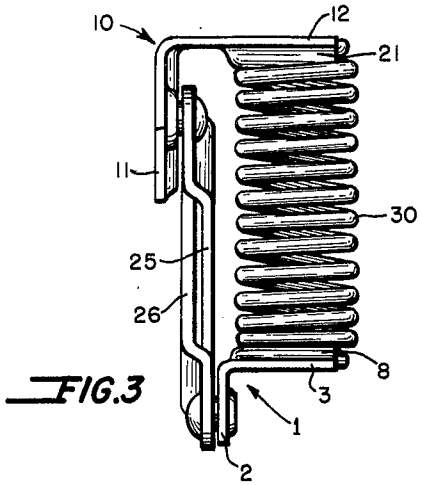


FIG. 3

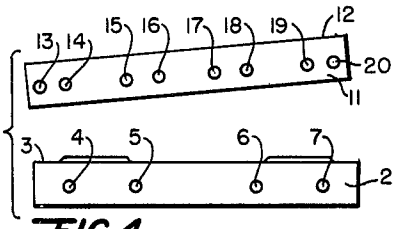


FIG. 4

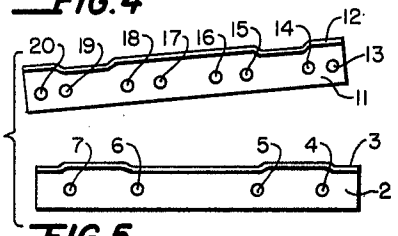


FIG. 5

INVENTOR.
EDWARD L. HAMPTON

BY Arthur Robert

ATTORNEY

United States Patent Office

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UNDERCARRIAGE ASSEMBLY FOR A ROCKING CHAIR

Edward L. Hampton, Louisville, Ky., assignor to Middletown Manufacturing Co., Inc., Middletown, Ky., a corporation of Kentucky

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This invention relates to improvements in an undercarriage assembly for a rocking chair.

It has heretofore been proposed (1) to mount a rocker plate upon a base member for relative forward-backward rocking movement about a transversely-extending rocking axis and (2) to cushion the forward and rearward extremes of such movement by springs. Thus, in the Babbitt U.S. Patent #3,070,342, the rocker plate is mounted on the base member by means of a front and rear declining leg arrangement and the extremes of the rocking movement are cushioned by front and rear tension springs. This is not a satisfactory construction. In the patented art prior to Babbitt, it was customary to mount the rocker plate on the base member through a centrally positioned fixed pivot and to cushion the rocking movement by front and rear compression springs. Such prior art structures are not satisfactory. In the copending Hunt et al. application S.N. 282,188, filed April 22, 1963, which is owned by applicants' assignee but now abandoned, it is proposed to offset the fixed pivot rearwardly and to provide double action front springs, which cushion the extreme portion of the forward rocking movement by compression and the rearward rocking movement by tension. This has been a very satisfactory and commercially successful structure.

The principal objects of the present invention are: to improve the operation of rocking chair undercarriages of the type using rearwardly offset pivots in combination with double action front springs; and to decrease the cost of such undercarriages.

The full achievement of one of the principal objects of the present invention resides in my discovery that the operation of an undercarriage (of the type combining rearwardly offset pivots with double action front springs) can be very substantially improved by substituting a pair of front and rear declining legs (for each fixed pivot) and arranging these legs to provide a rearwardly-offset phantom pivot or axis. The cost of an undercarriage of this type can be reduced by manufacturing it in pairs of right and left assemblies which are separately constructed instead of being integrated into a single unit.

Since the presently preferred embodiment of an undercarriage, constructed in accordance with my invention, comprises a pair of right and left assemblies, the left assembly of such pair is illustrated in full (and the right assembly is illustrated in part) in the accompanying drawing wherein:

FIGS. 1–3 are top plan, outer-side and front-end elevational views, respectively, of said left assembly;

FIG. 4 is an outer-side elevational view showing only the base and rocker plate members of said left assembly; and

FIG. 5 is an inner-side elevational view showing only the base and rocker plate members of the right assembly.

Left assembly of FIGS. 1–4

The assembly illustrated in FIGS. 1–3 comprises: (a) a base member; (b) a rocker plate member; (c) means mounting the rocker plate member on the base member for forward-backward rocking movement; and (d) spring means for cushioning such movement.

Base member

The base member **1** is in the form of an angle iron of L-shape in cross section. It provides a downwardly-extending vertical wall **2** and an inwardly extending horizontal shelf **3**.

As best seen in FIG. 4, the vertical wall **2** of base member **1** is perforated at spaced intervals along its length with a series of 4 holes. Proceeding from the rear end of base member **1**, these holes are consecutively designated **4**, **5**, **6** and **7**. The base wall holes **4** and **6** (on the rear end portions of the rear and front halves respectively of base member **1**) are provided to receive the means for mounting the rocker plate on the base member **1** while the base wall holes **5** and **7** (on the front end portions of the rear and front halves respectively of base member **1**) are provided to receive the means for mounting the base member **1** (and the left assembly as a whole) upon a suitable rocking chair frame or base (not shown).

The front end portion of the horizontal shelf **3** is deformed upwardly to provide a boss **8** to receive the front spring means.

Rocker plate member

The rocker plate member **10** is in the form of an angle iron of L-shape in cross section. It provides a downwardly-extending horizontal shelf **12**.

As best seen in FIG. 4, the vertical wall **11** of the rocker plate member **10** is perforated at spaced intervals along its length with a series of 8 holes. Proceeding from the rear end of rocker plate member **10**, these holes are consecutively designated **13** through **20**. Both of the rocker wall holes **14** and **18** (on the rear end portions of the rear and front halves respectively of rocker plate member **10**) are provided to receive the means for mounting the rocker plate **10** on the base member **1** while all **4** of the rocker wall holes **13**, **16–17** and **20** are provided to receive the means for mounting the seat structure of the rocking chair upon the rocker plate member **10** (and the left assembly as a whole).

The front end portion of the shelf **12** is deformed downwardly to provide a boss **21** to receive the front spring means.

Rocker plate mounting means

In accordance with a particular feature of my invention, the rocker plate **10** is mounted on the base member **1** for back-and-forth rocking movement through a pair of rearwardly and forwardly declining legs **25** and **26**. The upper front end of the rearwardly declining leg **25** is pivotally secured to the rocker member **10** through a suitable rivet in the front rocker wall pivot-receiving hole **18**. The lower rear end of the same rearwardly declining leg **25** is pivotally secured to the base member **1** by means of a suitable rivet passing through the rear base wall pivot-receiving hole **4**.

The rear upper end of the forwardly declining leg **26** is pivotally secured to the rocker member **10** by a suitable rivet in the rear rocker wall hole **14**. The lower front end of the same forwardly declining leg **26** is pivotally secured to the base member **1** by a suitable rivet in base wall hole **6**.

The declining legs **25** and **26** provide a compound rocking movement between front and rear extremes. This compound movement may be viewed as including a rotational movement about a phantom horizontal axis which is so located as to intersect the long axes of both legs **25** and **26** and which travels back-and-forth along a flat arcuate path. This path is offset rearwardly from a vertical plane **27** passing transversely through the center of base member **1**. The neutral position of this axis is designated by the letter "N."

Spring means

The double action spring means comprises a coil spring **30** located on the front side of the phantom rocking axis, vertically arranged between the front end portions of the horizontal shelves **3** and **12** of the base and rocker plate members **1** and **10** and secured to both so as to be operative to cushion the extreme portion of the forward rocking movement by compression and of the backward rocking movement by tension. The length of spring **30** is selected to hold the rocker plate member **10** in a desired neutral position.

In the desired neutral position of the assembly, the arcuate path of the phantom axis has a neutral point designated "N." This path may be, and its neutral point "N" is rearwardly-offset from a vertical plane **31** which is centrally disposed between one vertical plane, which passes transversely through the vertical axis of the front spring **30** and another vertical plane which passes through the transverse axis of hole **4** about which the lower rear end of the rearwardly declining leg **26** turns.

Right assembly of FIG. 5

The right assembly may be and preferably is identical to the left assembly except for the end-to-end reversal of the base and rocker members **1** and **10**. In this reversal, their rear ends in the left assembly become their front ends in the right assembly. This reverses the **4** to **7** and **13** to **20** order of their respective side wall openings. As a consequence, the rearwardly declining leg **25** of the right assembly extends from hole **15** to hole **7** while the forwardly declining leg extends from hole **19** to hole **5**.

Also the front spring **30** for the right assembly extends from boss **21A** on the front end of horizontal shelf **12** of the rocker member **10** vertically downward to boss **8A** on the front end horizontal shelf **3** of the base member **1**. To make the base and rocker plate members **1** and **10** reversible, the bosses **8A** and **21A** are provided at the rear end of their respective members in the left assembly.

Miscellaneous

The right and left assemblies of my undercarriage may, of course, be constructed as a single integral unit. Preferably, they are separately constructed. Each separately constructed assembly is made from the same identical parts and such parts are simple and inexpensive in character. The assembly of these parts into separate right and left assemblies is easy and that can be done quickly because opposite sides of the parts remain readily accessible at all times during the assembly.

When separate assemblies are installed in a rocking chair, the lateral spacing therebetween is not restricted as it is in integral units. This feature not only permits wider spacing resulting in more stable construction but also gives the chair designer more flexibility in the design of the chair. Furthermore, it provides the chair with a combination gliding and rocking movement which is much smoother in operation than a pure rocking movement. All of these advantages are achieved at a lower cost.

It will be appreciated that the rocker assembly constructed in accordance with my invention comprises: (A) a base member **1** and a rocker member **10** positioned over and spaced upwardly from the base member, each of these members presenting a vertical wall and a horizontal shelf; (B) an X-shaped arrangement of rearwardly and forwardly declining legs **25** and **26** vertically arranged between said members and pivotally secured to both so as to mount the rocker member **10** on the base member **1** for relative forward-backward rocking movement between front and rear extremes on opposite sides of a neutral position N and about a phantom transversely-extending horizontal axis which, in the neutral position

of the rocker member, is offset a substantial distance rearwardly from a vertical plane **27** passing transversely through the mid-portion of the base member; and double action spring means **30** vertically arranged between the front halves of the rocker member and base member and secured to both for tension and compression cushioning purposes.

I have secured excellent results with an embodiment of the character illustrated wherein: the base and rocker members **1** and **10** are 8" long and 1" high; each of said declining legs is 5.4" long between the axes of its upper and lower pivots; and the spring **30**, which normally holds the rocker member **10** in a forwardly-inclined neutral position at a forwardly-open angle of plus 6°10', limits the extreme forwardly-declining position of that member to a forwardly-open angle of minus 1°10'. Using the term A-plane, B-plane and C-plane to designate vertical planes passing transversely through the centers of base pivot hole **4**, base pivot hole **6** and spring **30**, respectively, the planes of the aforesaid embodiment, in its neutral position, are spaced as follows: the A–N planes 2.10"; the A–**31** planes 2.9"; the A–**27** planes 3.15"; the A–B planes 4.63"; and the A–C planes 5.75". In this embodiment, the neutral position "N" of the phantom axis is rearwardly offset ¾ of an inch from the plane **31** and slightly more than 1" from plane **27**. The total forward-rearward horizontal movement of the phantom axis is believed to approximate 1" so that the most forward position of that phantom axis is rearwardly spaced ¼ of an inch more or less from plane **31**. All of the foregoing measurements are approximations.

Having described my invention, I claim:

1. In rocking chair and like undercarriages of the type using a pair of laterally-spaced physically separate rocker assemblies, an improved rocker assembly comprising:

(A) a pair of members, including a base member and a rocker member positioned over and spaced upwardly from the base member;

(B) an X-shaped arrangement of rearwardly and forwardly declining legs vertically arranged between said members and pivotally secured to both

(1) so as to mount the rocket member on the base member for relative forward-backward rocking movement

(a) between front and rear extremes on opposite sides of a neutral position and

(b) about a phantom transversely-extending horizontal axis; and

(C) double action spring means vertically arranged between the front halves of the rocker plate and base member and rigidly secured to both for tension and compression cushioning purposes,

(1) said spring means yieldably urging said legs toward and normally holding them in a neutral position wherein said phantom axis is offset a substantial distance rearwardly from a vertical plane passing transversely through the mid portion of said base member.

2. The assembly of claim **1** wherein:

(A) the lower end of said rearwardly declining leg is pivoted to the rear end portion of the base member by a rear base pivot having a transversely-extending horizontal axis;

(B) said double action spring means includes a coil spring having a vertical axis; and

(C) said X-shaped arrangement has its phantom axis offset, in the neutral position of said rocker member, a substantial distance rearwardly from a vertical plane which is centrally disposed between two other vertical planes,

(1) one passing transversely through the vertical axis of the front spring, and

(2) the other passing transversely through the horizontal axis of said rear base pivot.

3. The assembly of claim 2 wherein:

(A) each of said pair of members presents, in cross section, a vertical wall and a horizontal shelf; and

(B) in its neutral position, said horizontal shelf of said rocker member is forwardly inclined.

4. The assembly of claim 3 in combination with

(A) another like assembly cooperating therewith to provide the right and left assemblies of one pair,

(1) the corresponding base members of said right and left assemblies being constructed for interchangeable use with

(a) one pair of spaced pivot-receivers for the pivots of right assembly legs and another pair of spaced pivot-receivers for the pivots of left assembly legs, and

(b) one spring mounting at one end for a right assembly spring and another spring mounting at the opposite end for a left assembly spring.

5. The combination of claim 4 wherein:

(A) the corresponding rocker members of said right and left assemblies are constructed for interchangeable use with leg pivot-receivers and spring mountings corresponding to those in said base members.

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CLAUDE A. LE ROY, *Primary Examiner.*