March 18, 1952 A. A. MAY 2,589,562

SPRING CONSTRUCTION FOR CRADLES

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Fig. 1.

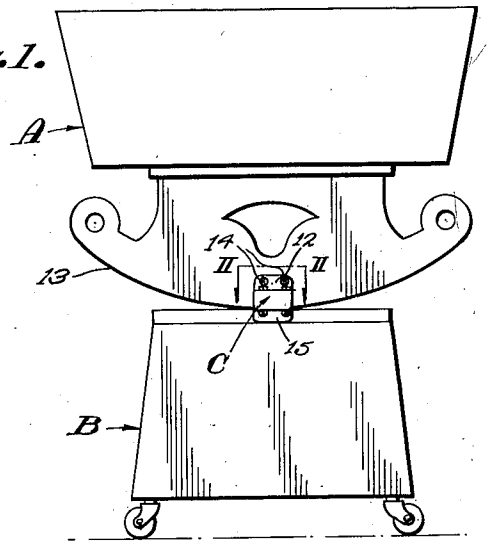



Fig. 2.

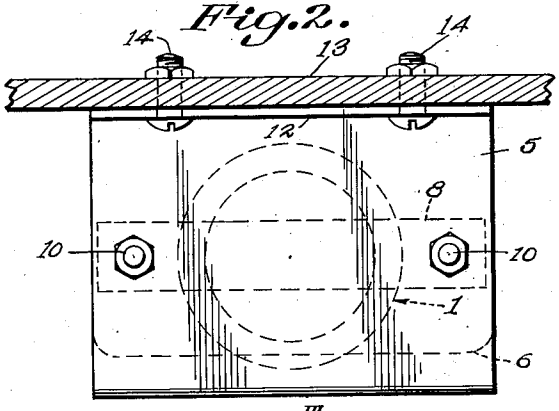
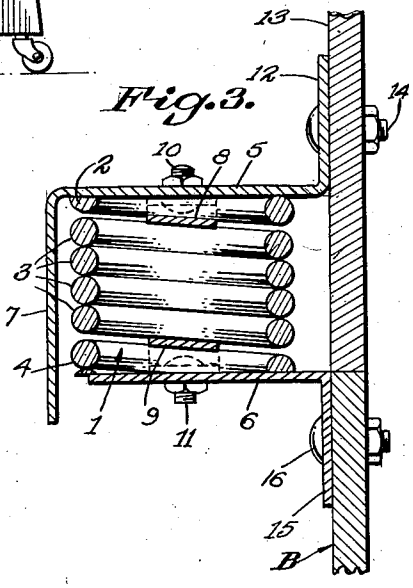



Fig. 3.



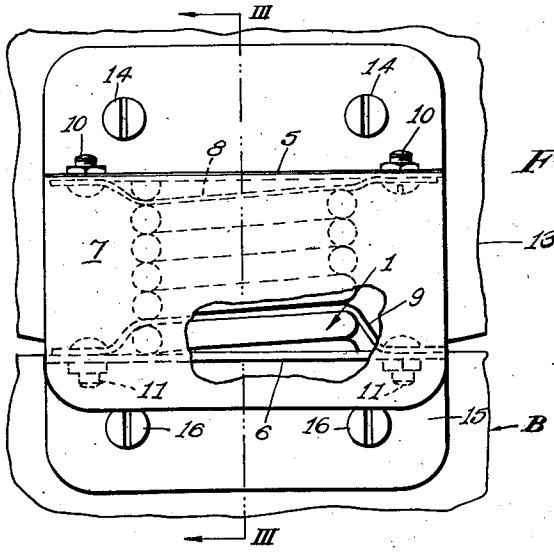




Fig. 4.

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## SPRING CONSTRUCTION FOR CRADLES

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3 Claims. (Cl. 5—105)

1

The present invention has for one of its principal objects the provision of an improved coil spring mounted in a housing covering the entire top and bottom of the spring, the terminal end of the last coil on each end of the spring is reduced in thickness or beveled off to present a flat spring end surface so that the top and bottom plates of the housing may firmly set thereon, and thereby prevent contraction of the end coils when they are secured to said plates and thus effect a smooth distribution of weight on each coil throughout the entire spring.

A further object of this invention is to provide a housing for a coil spring of the above-indicated character which forms a complete protection for the spring particularly from the top, bottom and front thereof, so that there is no possibility of objects engaging the spring or being caught therein, whether or not the spring is in motion.

A still further object of this invention is to provide a spring construction which while protected by the housing as aforesaid, is adapted to be mounted exteriorly of the operating instrumentalities controlled thereby and to be so mounted that it will be noiseless in its operation.

Further objects of the invention will become apparent as the description proceeds, and the features of novelty will be pointed out in the appended claims.

The invention will be understood more readily by reference to the accompanying drawings, in which

Fig. 1 is an end elevation of the invention, showing an illustrative embodiment thereof.

Fig. 2 is a sectional plan view taken on the line II—II of Fig. 1, looking in the direction of the arrows.

Fig. 3 is a vertical sectional view of the improved spring construction of the invention, the view being taken on the line III—III of Fig. 4, looking in the direction of the arrows.

Fig. 4 is an enlarged elevational view of the improved spring construction, the view showing parts broken away for clarity.

Briefly, the present invention is shown in connection with a rocker-type article of furniture that is rocked with the assistance of a spring which provides a smooth rocking movement with a minimum of effort. Thus in the embodiment of the invention in an infant's cradle, a smooth rocking movement is of importance, coupled with a construction whereby the cradle will be rocked without tiring an operator thereof, and at the same time providing an assembly which will be

2

approximately equal in height to a hospital bed. While the embodiment of the invention is shown as an infant's cradle, and will be specifically so described, it will be understood that this is because the invention is adapted especially for such use, although it will be apparent that such embodiment is illustrative only in character, as it may be embodied without substantial change in a very wide diversity of applications.

While the invention has been stated above as related to spring cushioned articles of furniture exemplified by a rocker cradle or crib, it may be said that in its more general aspects the invention relates more particularly to an improved construction of a spring itself, which while adapted especially for the indicated use, is not limited by any means thereto.

Referring more particularly to the drawings, A represents a rocker-type spring-controlled article of furniture, such as a crib or cradle, which is mounted on a stand B so as to bring the crib A to a convenient level such as the height of a hospital bed. The spring control is indicated generally at C, and forms the substance of this invention, the crib A and stand B being only in the nature of an illustrative application of the improved spring construction of the present invention.

As has been indicated above in the stated objects of the invention, the improved construction embodies a coil spring 1 of predetermined gage and stiffness, and made up of a plurality of coils or convolutions 2, 3 and 4, the top convolution being indicated at 2, the bottom at 4, and the intermediate convolutions being designated collectively as 3. The top convolution 2 and the bottom convolution 4 are leveled off from the pitch of the spiral of the spring so that a top plate 5 and a bottom plate 6 cover the entire top and bottom of the spring, and fit closely thereagainst over the entire area thereof. The top plate 5 is formed with a depending apron 7, which extends below the bottom plate and covers the front of the spring. The top and bottom plates are secured to the spring by straps or strips 8 and 9 which are composed preferably of strips of spring steel and which pass through the spring intermediate the top turn 2 and the intermediate turns 3 and between the bottom turn 4 of the spring and the intermediate turns 3. The straps 8 and 9 are bolted to the top and bottom plates, as indicated at 10 and 11, respectively, thereby firmly mounting the spring in the housing and securing it to the upper and lower plates 5 and 6. As illustrated in the drawings, the top plate 5 is provided

with an upstanding attaching flange 12 which is shown as affixed, in the present instance, to a rocker 13 of the article A by bolts 14, and the lower plate 6 is provided with a depending flange 15 which is bolted to the base or support B by bolts 16.

From the foregoing it will be apparent that an important feature of the improved construction is that the end coil on each end of the spring is leveled off, so that the upper and lower plate members cover the entire top and bottom of the spring, thus placing the ends of the spring firmly against the upper and lower plates and, at the same time, relieving the contractions from the end coils and placing a smooth distribution of weight on each coil throughout the entire spring, thus producing a smooth rocking motion for the cradle or other article A.

In the usual construction of this general type, a strain is placed on the first quarter of the end coils of the spring thus causing a bouncing action on the contractions of the first coil of the spring. The present spring also is protected completely, particularly from the top and bottom thereof and the front of the spring, thereby preventing accidental catching of any objects or articles between the turns of the spring. This enables the spring to be mounted on the outside of the cradle or other article controlled thereby, with attended convenience and lowered costs as it obviates any special structural modifications of either the controlled article or the mounting base being required. The use of the securing straps 8 and 9 eliminates squeaks and other noises during operation of the spring by holding the spring against tendency to slip relative to the plates 5 and 6.

It will be apparent from the foregoing that in its broader aspects, the present invention comprises a coil spring construction for controlling movement of a movable member relative to a stationary mounting member, the coil spring having an end convolution which decreases in diameter towards its end of the spring or its terminals thereby presenting a substantially flat planar area on the said end convolution, a substantially flat attaching member overlapping the end convolution, and means for securing the flat attaching member to the spring. It will be understood therefore that the invention contemplates within its scope such structure as will result in such features.

Although in practice I have found that the form of my invention illustrated in the accompanying drawings and referred to in the above description as the preferred embodiment, is the most efficient and practical, yet realizing that conditions concurrent with the adoption of my invention will necessarily vary, I desire to emphasize that various minor changes in details of construction, proportion and arrangement of parts, may be resorted to within the scope of the appended claims without departing from or sacrificing any of the principles of this invention.

Having thus described my invention, what I desire protected by Letters Patent is as set forth in the following claims:

1. A spring construction for controlling movement of a movable member relative to a stationary mounting member which comprises a spiral spring having end convolutions of a decreasing cross-sectional area corresponding in amount to the pitch of the spiral of the spring and being directed towards each end of the spring which therefore are of least thickness, whereby the end convolutions present substantially parallel planar areas, end plates covering the end convolutions, one of said end plates formed with an apron in front of the spring affording front coverage therefor, means adapted to secure one of the end plates to the movable member and the other end plate to the stationary member, and respective means extending through the spring and behind the end convolutions for securing the end plates to the spring.



2. A spring construction for controlling movement of a movable member relative to a stationary member, which comprises a spiral spring having end convolutions of decreasing cross-sectional area approximately corresponding in amount to the pitch of the spiral of the spring and being directed towards each end of the spring for producing in the end convolutions substantially parallel planar areas, end plates covering the end convolutions, an apron on one plate extending in front of the spring affording front coverage therefor, means adapted to secure one of the end plates to the movable member and the other end plate to the stationary member, and means extending through the spring behind the end convolutions for securing the end plates to the spring, the said means including straps and securing means for fastening the straps to the end plates.

3. In a cradle comprising a rockable cradle member having end rockers and a stationary base member, the improvement which consists in a special spring construction for controlling rocking of the cradle member on the stationary base member, the special spring construction comprising a spiral spring having end convolutions of decreasing cross-sectional area approximately corresponding in amount to the pitch of the spiral of the spring and decreasing towards the ends of the spring for producing in the end convolutions parallel planar areas, end plates covering the end convolutions and being parallel to each other, an apron on one plate extending in front of the spring affording front coverage therefor, means extending through the spring behind the end convolutions for securing the end plates to the spring, the said means including straps and securing means for fastening the spring straps to the end plates, means for securing one of the end plates to a rocker of the cradle member, and means for securing the other end plate to the stationary base member, the said end plates and apron defining a covering housing for the spring, the said housing and spring being mounted entirely exteriorly of the cradle rocker and the stationary member, the end convolutions of the spring having a configuration uniformly disposing the weight of the cradle member over intermediate convolutions of the spring for smooth control of rocking movements of the cradle member.

ANTHONY A. MAY.


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