Dec. 8, 1925. 1,564,601

M. R. MANGAN

SPRING STRUCTURE

Filed March 12, 1923

Fig. 1.

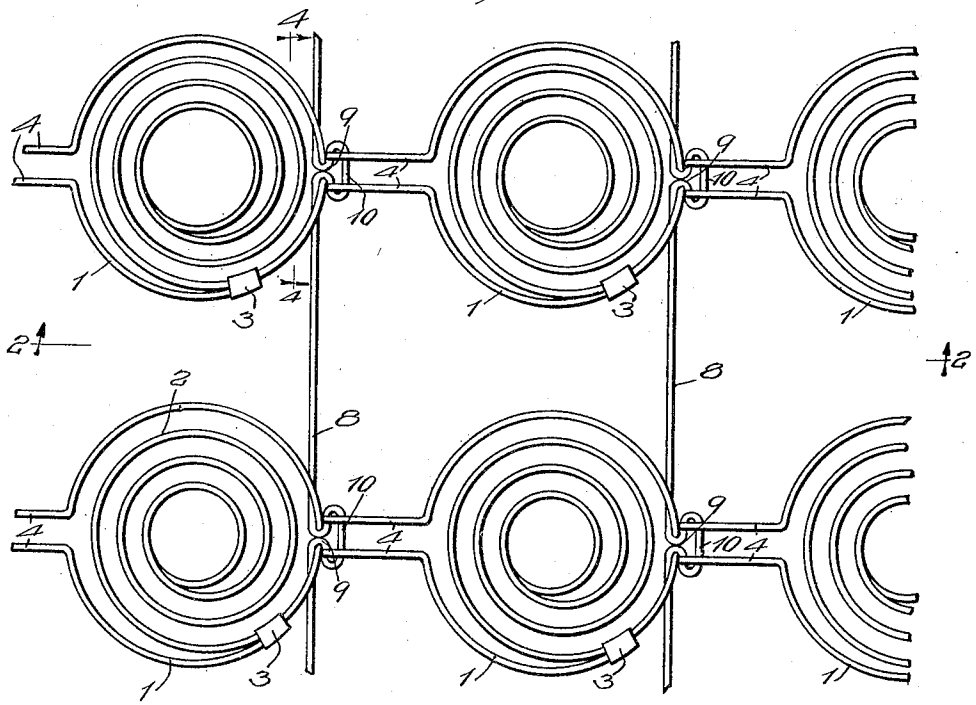


Fig. 2.

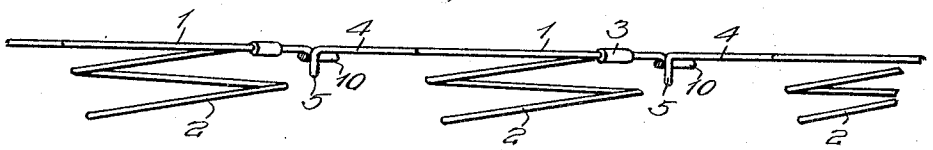


Fig. 3.

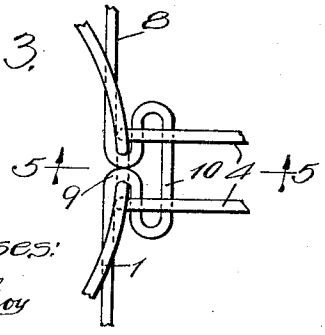


Fig. 4.

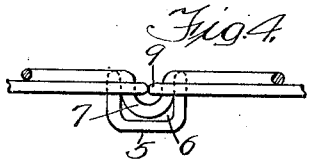
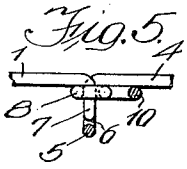


Fig. 5.



Witnesses:
W. F. Kilroy
Harry R. L. White

Inventor:
Michael R. Mangan
By Dike & Lee
Attys.

Patented Dec. 8, 1925. 1,564,601

UNITED STATES PATENT OFFICE.

MICHAEL R. MANGAN, OF CHICAGO, ILLINOIS.

SPRING STRUCTURE.

Application filed March 12, 1923. Serial No. 624,425.

To all whom it may concern:

Be it known that I, MICHAEL R. MANGAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spring Structures, of which the following is a description.

My invention relates to an improvement in a spring structure and particularly to such a structure adapted for use for beds, chairs, seats, and the like.

One of the objects of my invention is to provide means for interconnecting the adjacent relatively movable elements of the spring structure so as to permit a certain amount of pivotal vertical movement therebetween and a slight amount of lateral pivotal movement, but prevent any separation of the parts.

Other objects of my invention are to provide a device of the kind described, which is simple, neat, compact, economical, durable, reliable, efficient and satisfactory for use wherever found applicable.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosures herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or correponding parts:

Fig. 1 is a top plan view of a portion of a spring structure embodying my invention;

Fig. 2 is a section taken substantially on line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary detail;

Fig. 4 is a section taken substantially on line 4—4 of Fig. 1;

Fig. 5 is a section taken substantially on line 5—5 of Fig. 3.

In the drawings, wherein I have illustrated the preferred embodiment of my invention, there is shown a spring structure made up of a plurality of series of spring coil supporting elements, or links 1, and from which coil springs 2 may be carried either separate therefrom or integral therewith as shown, the coil parts being secured to the link parts in any suitable manner, as by clips 3. The general shape of the spring structure is defined by a rim frame, which is not shown, and to which the links 1 closest thereto may be connected in any suitable manner. Each of the link is made of a single piece of material, such as wire, bent to the form desired, and in the form shown each link is generally circular on its top portion and has a pair of substantially parallel arms 4 lying in the same plane as the main top body portion thereof but extending radially outwardly therefrom. The ends of said arms 4 are connected by an integral portion extending transversely thereof and offset horizontally downwardly therefrom, as at 5 (see Figs. 2, 4 and 5), so that a recess 6 is formed at the end of the offset portion of the link. Diametrically opposite this recess 6 each link is formed with another recess 7, also downwardly offset from the main body portion of the link, the recess 7 being of lesser depth and width than the recess 6 so that when the adjacent links are positioned as shown in the drawings, the smaller offset bend 7 may nest or seat within the larger offset bend 6 but be free of interconnection therewith.

In order to interconnect the parts of the spring structure so that it may support a mattress, or any other load, I have provided tie rods 8, each extending transversely across the adjacent links of the plurality of series of links and connected thereto without the use of any extraneous devices or attachments whatsoever, whereby a strong and durable interconnection results and in which the cost is greatly reduced not only in the labor involved but in the amount and cost of the materials used.

At regular intervals along the length of each of the tie rods 8 there are formed horizontally offset portions, each having a reduced neck portion 9 and an elongated and enlarged head 10 at the outer ends of said neck portions, as shown more clearly in Figs. 1 and 3. All of the parts of the tie rods lie in the same plane and the neck portion is of such size that it will seat within the smaller recess 7 of the links, with the head portion 10 underlying the arms 4 of one link, as shown more clearly in Figs. 1 and 3, and the main body portions of the tie rods 8 underlying the portions of the adjacent link most closely adjacent its smaller recess 7.

The links are assembled by placing the

smaller recessed offset 7 of one link within the larger recessed portion 6 of the adjacent link, said links being free of interconnection. Then the tie rod 8 is so interlocked with both of said adjacent links that its neck portion seats within the uppermost recess 7, the head portion and the main body portion of the tie rod arranged at opposite sides of said neck portion and underlying and engaging the adjacent portions of the respective links of the pair of links.

The links when thus connected may pivot vertically as will be clear from the section shown in Fig. 5, and there will be more or less play in a horizontal plane, depending upon the distance between the head portion 10 and the main body portion of the connecting or tie rods 8. The links are absolutely locked against separation, however, and all of this has been done without the use of clips, or other extraneous devices. The ends of the tie rods 8 may be connected to the rim frame, not shown, by any suitable means.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. A spring structure comprising adjacent links, each having downwardly extending offsets at diametrically opposed ends thereof, one of said offset portions being of lesser width and depth than the other, and a tie rod interconnected with the adjacent links when said links are arranged with the smaller offset portion of one within the larger offset portion of the other so as to prevent separation of said links but permit their vertical pivoting movement.

2. A spring structure comprising a plurality of links, each link having a pair of diametrically opposed downwardly extending offsets, one of said offsets being of lesser depth and width than the other so that when the upper sides of said links are arranged in the same plane end to end, the smaller offset portion may nest in the larger offset portion, and a tie rod having offset portions interconnected with the nested offsets of the links to prevent separation thereat.

3. A spring structure comprising a plurality of parallel series of links, each link having a pair of diametrically opposed downwardly extending offsets therein, one of said offsets being of lesser depth and width than the other offset so that when the links are arranged with their tops in the same plane end to end the smaller offset will seat in the larger, and a tie rod extending transversely across said series of links and interconnected between the adjacent links of each series, said tie rod having all of its portions lying in the same plane and having an offset neck-portion to lie within the smaller offset of one of said adjacent links, and having a head portion at the end of said neck portion, and thence extending in opposite directions below said links transversely of said neck portion.

4. A spring structure comprising adjacent links free of interconnection, each having a pair of downwardly offset bent portions therein, one bent portion being of lesser depth and width than the other so that when a pair of links are arranged end to end with their tops in the same plane, the smaller bent portion may seat in the larger bent portion, and a tie rod extending transversely across said links with all of its portions lying in the same plane and having a neck portion arranged intermediate the adjacent bent portions of both of said links therebelow and interconnected to both of said links thereat so that the tops of said links will lie substantially in the same plane.

5. A spring structure comprising a plurality of series of links, the adjacent links of each series being free of interconnection and each having a pair of diametrically opposed downwardly extending offset portions, one of said offset portions being of lesser depth and width than the other so that it may seat in the larger offset portion of an adjacent link and permit pivotal movement vertically therebetween, and a tie rod having all of its portions lying substantially in the same plane with offsets formed at intervals therealong, said offsets being integral with the tie rod and each comprising a neck and an enlarged head portion, the head portion of which is adapted to lie below one of said links in engagement therewith, the neck portion adapted to seat in the smaller of said pair of offsets of the links, and the main portion of the tie rod adapted to lie below the main body portion of said links.

6. A spring structure comprising a plurality of parallel series of links, each link having a substantially circular portion with a pair of parallel spaced arms offset radially outwardly therefrom and lying in the same plane therewith and a downwardly extending coil spring, the outer ends of said arms connected by an integral horizontally offset portion, each of said links also having a smaller horizontal portion diametrically opposite the first mentioned downwardly offset portion so that said smaller offset portion of one link may seat within the larger offset portion of the adjacent link, and a tie rod made of a single piece of material, all portions of which lie in the same plane and

with horizontal offsets at intervals therealong, each offset comprising a reduced neck portion and an enlarged head portion, whereby the neck portion may be seated within the smaller offset of one of said adjoining links and the head portion and the main body portion arranged on opposite sides thereof to engage said pair of parallel arms of one link and the portions adjoining the smaller offset portion of the other link.

In testimony whereof, I have hereunto signed my name.

MICHAEL R. MANGAN.