March 5, 1935. G. A. STACKHOUSE 1,993,189

SPRING ASSEMBLING APPARATUS

Filed June 20, 1934 2 Sheets-Sheet 2

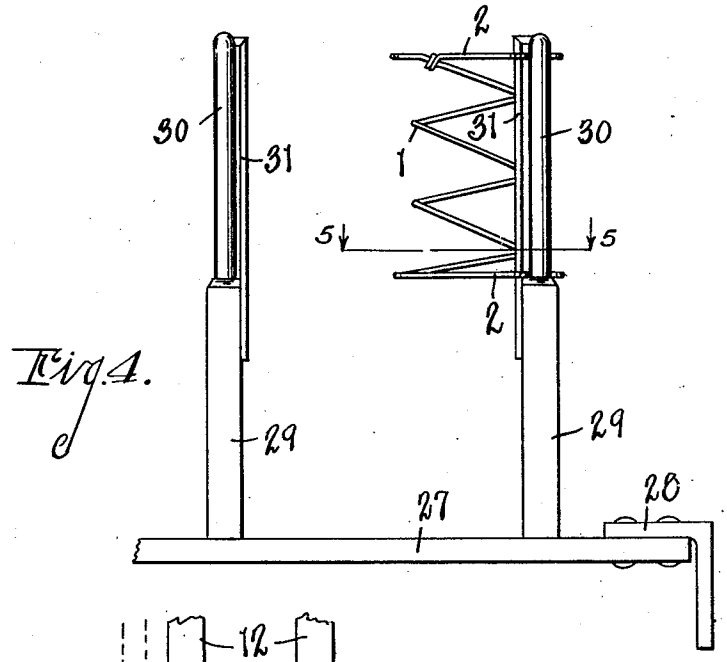


Fig. 4.

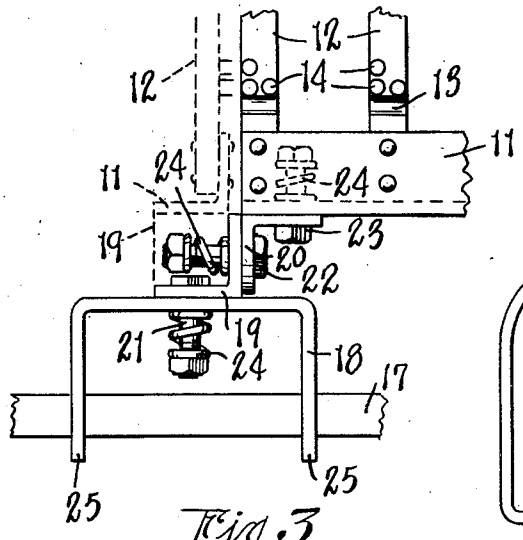


Fig. 3.

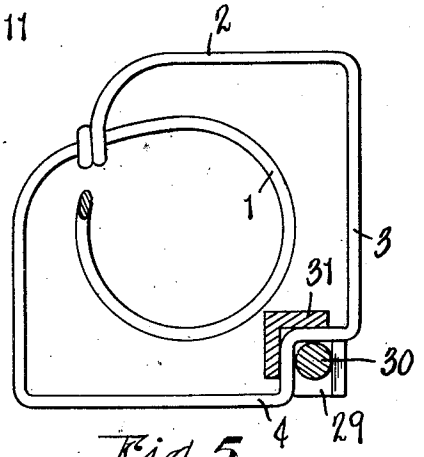


Fig. 5.

INVENTOR
George A. Stackhouse
BY Chappell & Earl
ATTORNEYS

March 5, 1935. G. A. STACKHOUSE 1,993,189

SPRING ASSEMBLING APPARATUS

Filed June 20, 1934 2 Sheets-Sheet 1

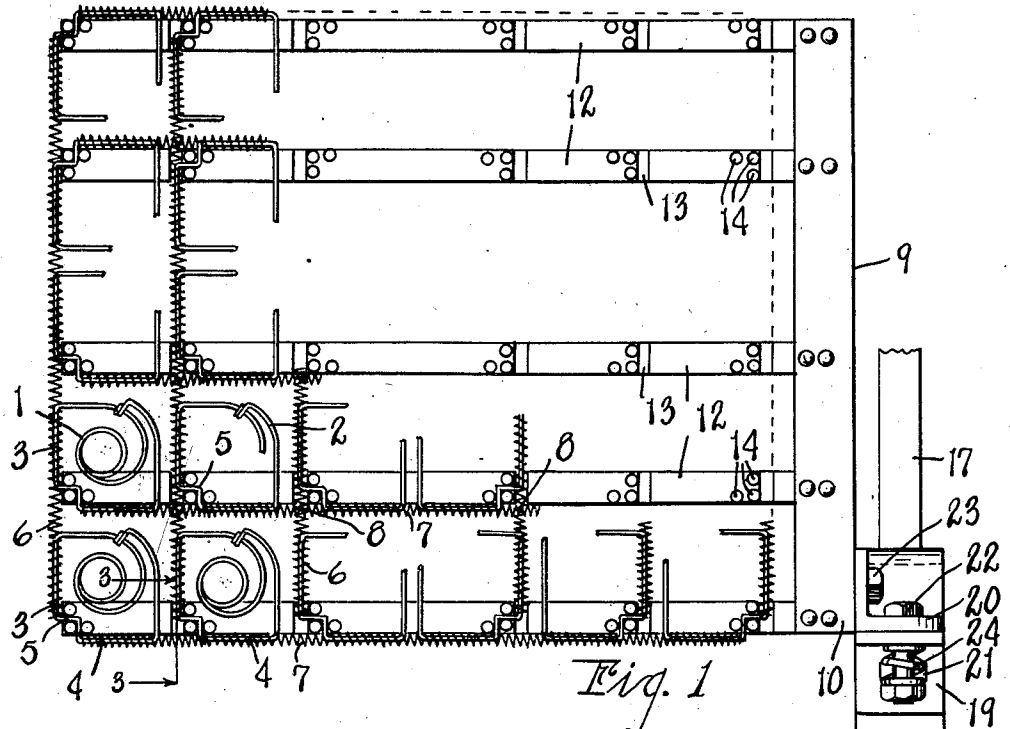


Fig. 1

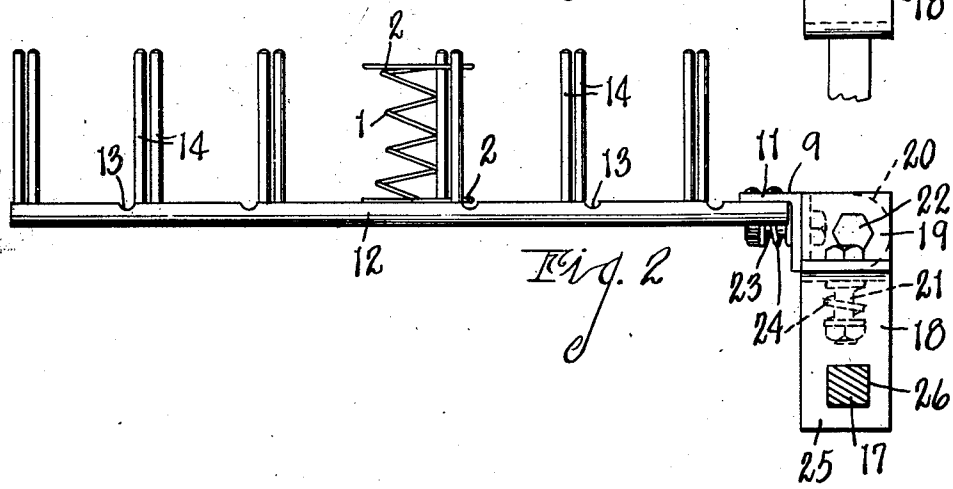


Fig. 2

INVENTOR.
George A. Stackhouse
BY Chappell & Earl
ATTORNEYS

Patented Mar. 5, 1935 1,993,189

UNITED STATES PATENT OFFICE

1,993,189

SPRING ASSEMBLING APPARATUS

George A. Stackhouse, Oakland, Calif., assignor to L. A. Young Spring and Wire Corporation, Detroit, Mich.

Application June 20, 1934, Serial No. 731,420

26 Claims. (Cl. 140—3)

The main objects of this invention are:

First, to provide an improved method of and means for assembling spring structures such as cushions consisting of transverse and longitudinal rows of body springs having their end coils suitably conformed to receive transverse and longitudinal helical tie members.

Second, to provide a spring assembling apparatus having means associated therewith for positively and accurately holding the end coils of the body springs in proper position so that the helical tie members can be screwed or threaded into engagement therewith and their crossings interconnected clear of such end coils.

Third, to provide a spring assembling apparatus of this character which is simple and economical in its parts, and very efficient and effective for the purpose intended.

Objects relating to details and economies of my invention will appear from the description to follow. The invention is defined and pointed out in the claims.

Structures which are preferred embodiments of my invention are illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary top plan view of a spring assembling apparatus embodying the features of my invention.

Fig. 2 is a view mainly in side elevation.

Fig. 3 is a fragmentary view in rear elevation, the dotted lines showing the position of the parts as they are in Fig. 1.

Fig. 4 is a fragmentary view in side elevation of a modification.

Fig. 5 is an enlarged detail section taken on a line corresponding to line 5—5 of Fig. 4.

The present apparatus is designed by me especially for assembling spring structures of the character disclosed by my copending application, Serial No. 731,419, filed June 20, 1934. In general, such spring structures consist of body springs 1 arranged in longitudinal and transverse rows, the end or terminal coils 2 of the body springs having straight portions 3 and 4 disposed at right angles to each other with corner offsets 5. The straight portions of the end coils are alined and connected by transverse helical tie members 6 and longitudinal helical tie members 7, the latter being interconnected at their crossing point 8 within the spring structure clear of the end coils of the body springs.

For holding the body springs with their end coils in proper position, I provide a bed 9 which is mounted at one corner 10 for universal adjustment on a stationary support (not shown). My bed comprises a head member or bar 11 of angle iron and spaced parallel longitudinal supports, members or bars 12 preferably of half-round section, the inner ends of the latter being rigidly secured to one of the flanges of the angle iron with their flat faces disposed against the inner side of such flange. The bars 12 are provided with spaced transverse grooves 13 in their flat faces, the grooves being arranged in alined rows for the passage of the transverse helical tie members 6.

Adjacent each transverse groove 13 and on the bars 12, I mount three spaced upright anchoring pins or holders 14, the pins being arranged to form a right triangle, as shown, the sides of the triangles being in longitudinal and transverse alinement at the edges of the bars 12 and transverse grooves 13 respectively. The arrangement in each quadrant of the bed is preferably such that the grooves are between their pins and the end of the bed, and the longitudinal sides of the triangles are adjacent the edge of the longitudinal members nearest the side of the bed.

The spaced pins are arranged and disposed on the longitudinal members to receive between them the corner offsets 5 in the end coils 2 of the body springs 1 and hold the straight portions 3 and 4 of the end coils in transverse and longitudinal alinement with the straight portions overhanging the transverse grooves and sides of the longitudinal and transverse helical tie members may be screwed into engagement therewith from the sides and outer end of the bed by means of a spring assembling appliance (not shown).

The bed is supported for universal adjustment by means of beam 17, channel-like bracket 18, first L-shaped bracket 19, and second L-shaped bracket 20, these parts being pivotally connected by bolts 21, 22, and 23 arranged at right angles to each other and provided with coiled compression springs 24 acting to establish a certain amount of friction between the parts to hold the bed in adjusted position relative to the stationary support (not shown). The beam 17 is preferably of non-circular or square cross section as shown, the flanges 25 of the channel being provided with openings 26 fitting the beam. With this universal support, the bed can be universally adjusted as desired, which greatly facilitates the assembling steps.

Referring to Figs. 5 and 6, 27 is a longitudinal bar secured at its inner end to the end member 28, the bar having mounted thereon square posts 29. The posts have round holders or pins 30 at their tops for coaction with the holders 31 of

angle section secured to the inner corners of the posts, the holders being adapted to receive between them the corner offsets 5 of the end coils 2 of the body springs 1 for holding the straight portions 3 and 4 thereof in alinement for receiving the helical tie members. Otherwise, the apparatus is similar to that described above in connection with Figs. 1 to 4, inclusive.

A spring structure is assembled by means of my apparatus by placing the corner offsets between the uprights 14 as illustrated by Figs. 1 and 2, the uprights acting to hold the end coils with their straight portions in proper position to receive the transverse and longitudinal helical tie members. The latter are screwed into position from the sides and outer end of the bed, the helicals having a clear passage throughout their travel except where they cross. At their crossing point, the helicals are interconnected clear of the body springs. This results in a superior spring structure, inasmuch as the body springs are free to function independently of each other with the exception of the connection established by the helical ties.

After the spring structure has been assembled in this manner, it is readily lifted from the bed and is ready for use. It is thus seen that my method and apparatus for assembling spring structures is not only simple and economical but produces a superior product.

I have illustrated and described my improvements in embodiments which I have found very practical. I have not attempted to illustrate or describe other embodiments or adaptations as it is believed this disclosure will enable those skilled in the art to embody or adapt my improvements as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a spring assembling apparatus, the combination with a support, of a spring assembling bed pivotally mounted at one corner on said support for universal adjustment and comprising a head member of angle iron, spaced longitudinal bars of half-round section secured at their inner ends to said head member, said longitudinal bars having spaced transverse grooves in their flat faces, the grooves being arranged in transverse rows for the passage of helical tie members, and three spaced holders mounted adjacent each groove on said longitudinal bars and arranged to form a right triangle, the sides of the triangles being in longitudinal and transverse alinement at the edges of the longitudinal bars and transverse grooves respectively.

2. In a spring assembling apparatus, a spring assembling bed comprising a head member of angle iron, spaced longitudinal bars of half-round section secured at their inner ends to said head member, said longitudinal bars having spaced transverse grooves in their flat faces, the grooves being arranged in transverse rows for the passage of helical tie members, and three spaced holders mounted adjacent each groove on said longitudinal bars and arranged to form a right triangle, the sides of the triangles being in longitudinal and transverse alinement at the edges of the longitudinal bars and transverse grooves respectively.

3. In a spring assembling apparatus, a spring assembling bed comprising a head member of angle iron, spaced longitudinal bars of half-round section secured at their inner ends to said head member, said longitudinal bars having spaced transverse grooves in their flat faces, the grooves being arranged in transverse rows for the passage of helical tie members, and spaced holders mounted adjacent each groove on said longitudinal bars and arranged to form a right triangle, the sides of the triangles being in longitudinal and transverse alinement at the edges of the longitudinal bars and transverse grooves respectively, the arrangement in each quadrant of the bed being such that the grooves are between their holders and the end of the bed and the longitudinal sides of the triangles are adjacent the edge of the longitudinal members nearest the side of the bed.

4. In a spring assembling apparatus, a spring assembling bed comprising spaced bars, said bars having spaced transverse grooves in their faces, the grooves being arranged in transverse rows for the passage of helical tie members, and three spaced holders mounted adjacent each groove on said bars and arranged to form a right triangle, the sides of the triangles being in longitudinal and transverse alinement at the edges of the longitudinal bars and transverse grooves respectively, the arrangement in each quadrant of the bed being such that the grooves are between their holders and the end of the bed and the longitudinal sides of the triangles are adjacent the edge of the longitudinal members nearest the side of the bed.

5. In a spring assembling apparatus, a spring assembling bed comprising spaced bars, said bars having spaced transverse grooves in their faces, the grooves being arranged in transverse rows for the passage of helical tie members, and spaced holders mounted adjacent each groove on said bars and arranged to form a triangle, the sides of the triangles being in longitudinal and transverse alinement at the edges of the longitudinal bars and transverse grooves respectively.

6. In a spring assembling apparatus, a spring assembling bed pivotally mounted at one corner for universal adjustment and comprising spaced bars, said bars having spaced transverse grooves in their faces, the grooves being arranged in transverse rows for the passage of helical tie members, and spaced holders mounted adjacent each groove on said bars and arranged to form a triangle, the sides of the triangles being in longitudinal and transverse alinement at the edges of the longitudinal bars and transverse grooves respectively.

7. In a spring assembling apparatus for assembling body springs having end coils provided with straight portions arranged at right angles and corner offsets, the combination of spaced parallel members having spaced transverse grooves in their faces, the grooves being arranged in transverse rows for the passage of helical tie members, and spaced holders mounted adjacent each groove on said spaced parallel members for receiving the corner offsets in the end coils of the body springs and holding the straight portions of the said end coils in transverse and longitudinal alinement.

8. In a spring assembling apparatus, the combination of a spring assembling bed comprising a head member, spaced longitudinal members secured at their inner ends to said head member, and spaced holders mounted on said longitudinal members, and means supported by a corner of said bed for universal adjustment comprising a channel-like bracket having square openings in its flanges, a first L-shaped bracket disposed on the web of said channel-like bracket, a second L-shaped bracket disposed between said first

L-shaped bracket and said head member, bolts pivotally connecting said brackets and head member, and coiled compression springs associated with said bolts for establishing a certain amount of friction between the parts to hold the bed in adjusted position.

9. In a spring assembling apparatus, the combination of a spring assembling bed comprising a head member, spaced longitudinal members secured at their inner ends to said head member, and spaced holders mounted on said longitudinal members, and means supported by a corner of said bed for universal adjustment.

10. In a spring assembling apparatus, the combination with a horizontal beam of non-circular cross section, of a spring assembling bed, and means connecting a corner of said bed to said beam for universal adjustment comprising a channel-like bracket having non-circular openings in its flanges fitting said beam, a first L-shaped bracket disposed on the web of said channel-like bracket, a second L-shaped bracket disposed between said first L-shaped bracket and said bed, and means pivotally connecting said brackets and bed.

11. In a spring assembling apparatus, the combination with a spring assembling bed, and a support, of means connecting said bed to said support for universal adjustment comprising a beam of non-circular section, a channel having flanges provided with openings fitting said beam, a first bracket pivotally connected to the web of said channel, and a second bracket pivotally connected to said first bracket and a corner of said bed, the pivots being arranged at right angles to each other and having spring means establishing friction between the parts to hold the bed in adjusted position relative to the support.

12. In a spring assembling apparatus for assembling body springs having end coils provided with straight portions arranged at right angles and corner offsets, and helical tie members, the combination of a bed mounted at one corner for tilting adjustment and comprising spaced supports having spaced transverse grooves for the transverse helical tie members, and spaced holders mounted on said supports adjacent each groove for receiving between them the corner offsets in the end coils of the body springs and holding the straight portions of the said end coils in transverse and longitudinal alinement, with said straight portions overhanging the transverse grooves and sides of the supports, respectively, so that the transverse and longitudinal helical tie members may be screwed into engagement therewith from the sides and outer end of the bed, the helical tie members being thereby interconnected at their crossings clear of said end coils.

13. In a spring assembling apparatus for assembling body springs having end coils provided with straight portions arranged at right angles and corner offsets, and helical tie members, the combination of a bed comprising spaced supports having spaced transverse grooves for the transverse helical tie members, and spaced holders mounted on said supports adjacent each groove for receiving between them the corner offsets in the end coils of the body springs and holding the straight portions of the said end coils in transverse and longitudinal alinement, with said straight portions overhanging the transverse grooves and sides of the supports, respectively, so that the transverse and longitudinal helical tie members may be screwed into engagement therewith from the sides and outer end of the bed, the helical tie members being thereby interconnected at their crossings clear of said end coils.

14. In a spring assembling apparatus for assembling body springs having end coils provided with portions arranged at right angles and offsets, and helical tie members, the combination of a bed comprising spaced bars having spaced transverse grooves for the transverse helical tie members, spaced holders mounted on said bars adjacent each groove for receiving between them the offsets in the end coils of the body springs and holding portions of the said end coils in transverse and longitudinal alinement, with said portions overhanging the transverse grooves and sides of the bars, respectively, so that the transverse and longitudinal helical tie members may be screwed into engagement therewith from the sides and outer end of the bed, the helical tie members being thereby interconnected at their crossings clear of said end coils.

15. In a spring assembling apparatus for assembling body springs having end coils provided with offsets, a bed comprising spaced holders for receiving the offsets in the end coils of the body springs and holding portions of the said end coils in transverse and longitudinal alinement, so that transverse and longitudinal helical tie members may be screwed into engagement therewith from the borders of the bed, the helical tie members being thereby interconnected at their crossings clear of said end coils.

16. In a spring assembling apparatus for assembling a spring structure comprising spaced transverse and longitudinal rows of body springs having end coils provided with straight portions arranged to form right corners having offsets, and transverse and longitudinal helical tie members, the combination of spaced bars, square posts mounted on said bars in transverse and longitudinal rows and having round holders at their tops, and holders of angle section secured to the inner corners of said posts for coaction with said round holders to receive between them the corner offsets of the end coils of the body springs for holding the straight portions thereof in alinement for receiving the helical tie members.

17. In a spring assembling apparatus for assembling a spring structure comprising spaced transverse and longitudinal rows of body springs having end coils provided with straight portions arranged to form right corners having offsets, and transverse and longitudinal helical tie members, the combination of spaced bars, and posts mounted on said bars in transverse and longitudinal rows and having spaced holders at their tops adapted to receive the corner offsets of the end coils of the body springs for holding the straight portions thereof in alinement for receiving the helical tie members.

18. In a spring assembling apparatus for assembling a spring structure comprising spaced transverse and longitudinal rows of body springs having end coils provided with offsets, the combination of spaced bars, and posts mounted on said bars in transverse and longitudinal rows and having holders at their tops spaced to receive between them the offsets of the end coils of the body springs for holding portions thereof in alinement for receiving helical tie members.

19. In a spring assembling apparatus for assembling a spring structure comprising spaced transverse and longitudinal rows of body springs having end coils provided with offsets, holding

means arranged in transverse and longitudinal rows and having holders spaced to receive the offsets of the end coils of the body springs for holding portions thereof in alinement for receiving helical tie members.

20. In a spring assembling apparatus, the combination of a bed mounted at one corner for universal tilting adjustment and having a plurality of spring holders arranged in rows, each holder comprising a group of upright pins disposed in triangular relation and adapted to receive springs having angular offsets in the end coils thereof.

21. In a spring assembling apparatus, the combination of a bed provided with a plurality of parallel rows of spring holders, the spring holders of the rows being arranged in transversely alined relation and each spring holder comprising a group of upright pins disposed in spaced relation to receive offsets formed in the springs to be assembled and whereby such springs are supported with parts thereof in alined relation to facilitate engagement of the alined parts by helical tie members.

22. In a spring assembling apparatus, the combination of a bed and a plurality of spring holders arranged in rows, each holder comprising a group of upright pins disposed in triangular relation and adapted to receive offsets of springs having angular offsets in the end coils thereof.

23. In a spring assembling apparatus, the combination of a bed and a plurality of spring holders arranged in rows, each holder comprising a group of upright pins disposed to receive offsets of springs having offsets in the end coils thereof.

24. In a spring assembling apparatus, the combination of a bed provided with a plurality of parallel rows of spring holders, the spring holders of the rows being arranged in transversely alined relation and each spring holder comprising pins disposed in spaced relation to receive offsets formed in the springs to be assembled and whereby such springs are supported with parts thereof in alined relation to facilitate engagement of the alined parts by helical tie members.

25. In a spring assembling apparatus for assembling a spring structure comprising a plurality of rows of body springs with the corresponding springs of the several rows in transversely alined relation, the springs having end coils provided with straight portions arranged to form right corners having angular inward offsets and transverse and longitudinal helical tie members, the combination of a bed, a plurality of rows of spring holders arranged on said bed in rows corresponding to the rows of the springs of the assembled structure, the corresponding holders of the rows being transversely alined, each holder comprising three pins arranged in triangular relation to receive the offsets of the springs between them and to support the corresponding straight portions of the springs to be assembled in alined relation to receive the helicals.

26. In a spring assembling apparatus for assembling a spring structure comprising a plurality of rows of body springs with the corresponding springs of the several rows in transversely alined relation, the springs having end coils provided with straight portions arranged to form right corners having angular inward offsets and transverse and longitudinal helical tie members, the combination of a bed, a plurality of rows of spring holders arranged on said bed in rows corresponding to the rows of the springs of the assembled structure, the corresponding holders of the rows being transversely alined, each holder comprising pins arranged to engage the offsets of the springs and to support the corresponding straight portions of the springs to be assembled in alined relation to receive the helicals.

GEORGE A. STACKHOUSE.