Aug. 28, 1934. F. C. BOUSER 1,971,765

SPIRAL SPRING STRUCTURE AND METHOD OF MAKING SAME

Filed Feb. 8, 1933 3 Sheets-Sheet 1

Fig 1

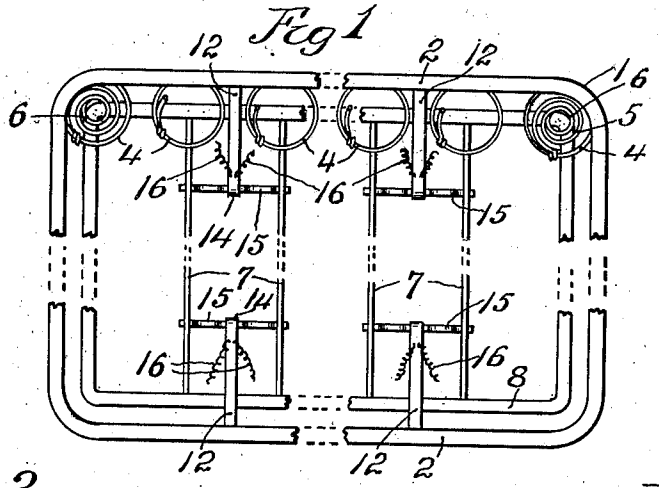


Fig 2

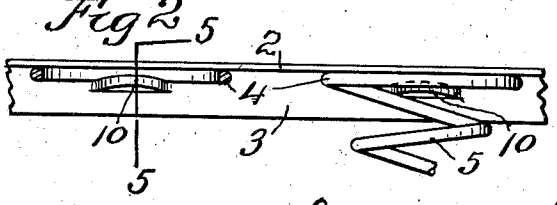


Fig 5

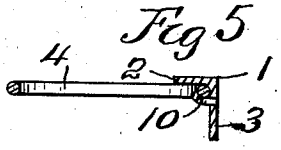


Fig 3

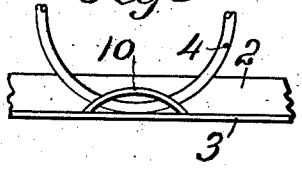


Fig 4



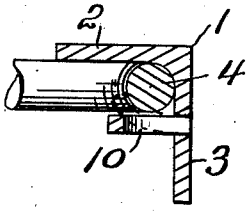
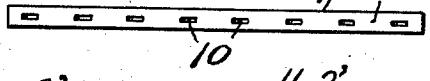


Fig 6

Fig 7



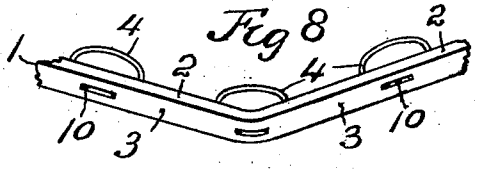


Fig 8

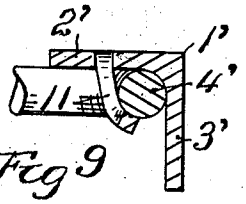


Fig 9

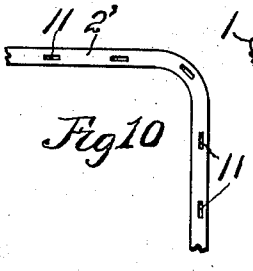


Fig 10

Witness
H. Vernon Olson

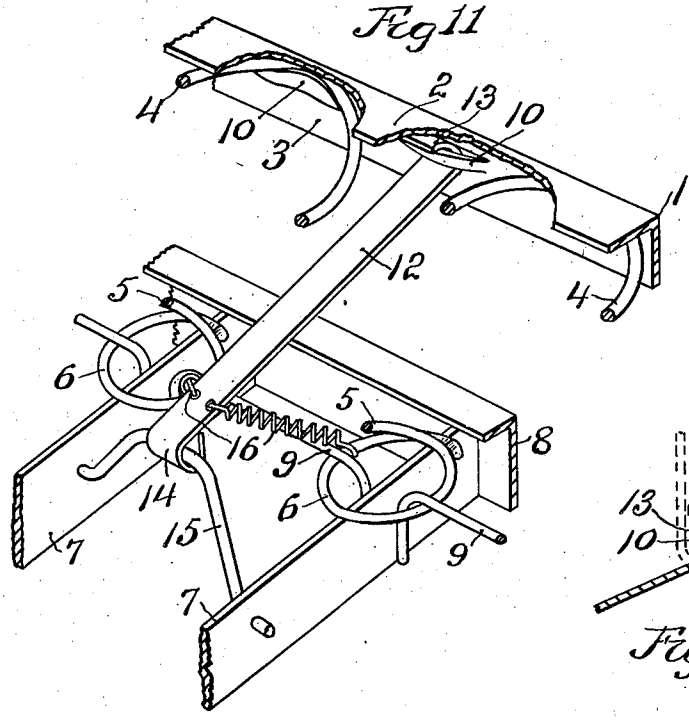
Fred C. Bouser INVENTOR
BY Warren W. House
His ATTORNEY

Aug. 28, 1934. F. C. BOUSER 1,971,765

SPIRAL SPRING STRUCTURE AND METHOD OF MAKING SAME

Filed Feb. 8, 1933 3 Sheets-Sheet 2

Fig 11



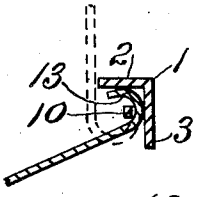
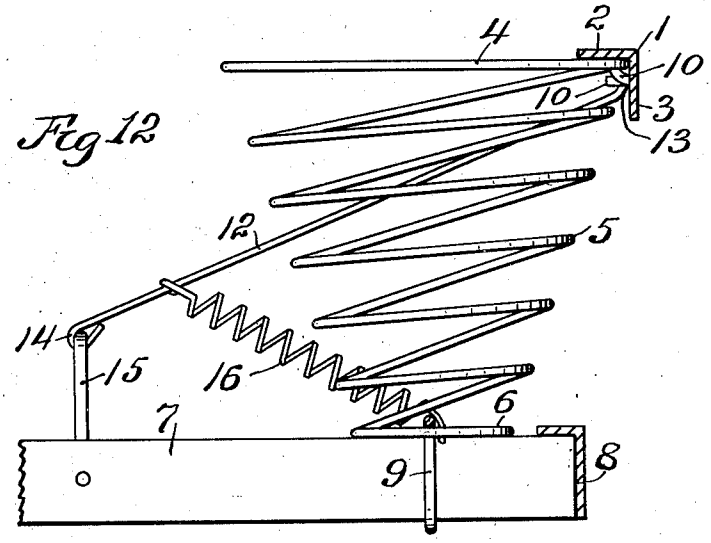


Fig 13

Fig 12



INVENTOR

Fred C. Bouser

BY Warren W. House

His ATTORNEY

Witness

H. Vernon Olson

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SPIRAL SPRING STRUCTURE AND METHOD OF MAKING SAME

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Fig 14

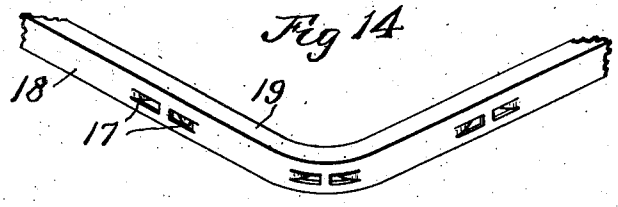


Fig 15

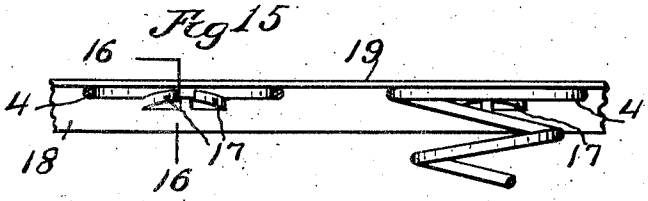


Fig 16

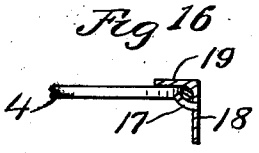


Fig 17

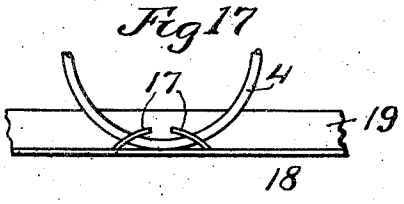


Fig 18

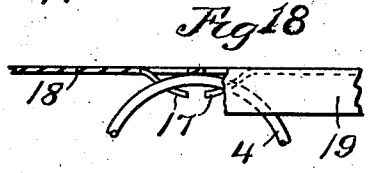


Fig 19

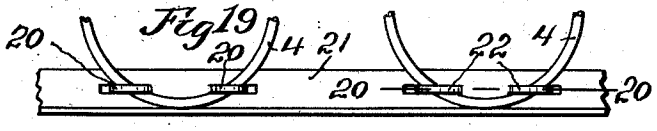


Fig 20

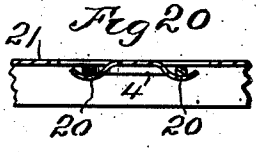


Fig 21

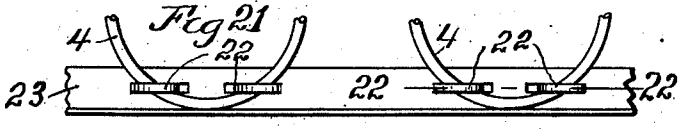


Fig 22

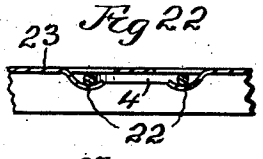


Fig 23

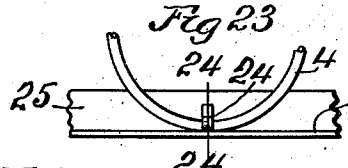


Fig 24

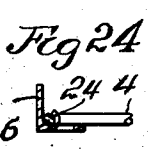


Fig 25

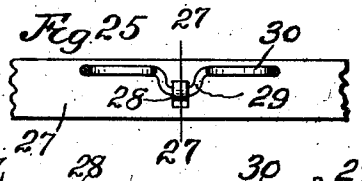


Fig 26

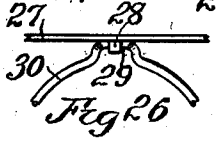


Fig 27

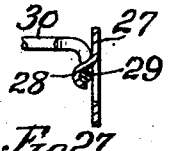


Fig 28

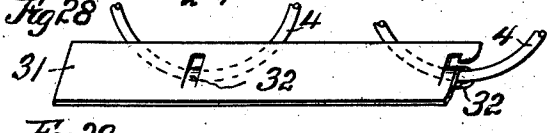
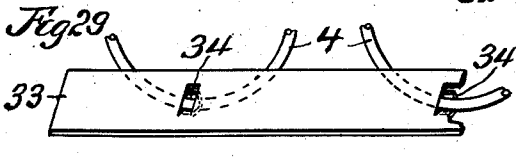


Fig 29



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Patented Aug. 28, 1934 1,971,765

UNITED STATES PATENT OFFICE

1,971,765

SPIRAL SPRING STRUCTURE AND METHOD OF MAKING SAME

Fred C. Bouser, Louisville, Ky., assignor to Leggett and Platt Spring Bed Manufacturing Company, Carthage, Mo., a corporation of Missouri

Application February 8, 1933, Serial No. 655,782

4 Claims. (Cl. 29—173)

My invention relates to improvements in spiral spring structures and methods of making same. It relates particularly to a bar having novel means for attachment to spiral springs such as are employed in spring beds, seats, and similar structures.

One object of my invention is the provision of a novel method of attaching spiral springs to a connecting bar, which will afford a secure fastening for the springs, which will pivotally hold the springs so that they may be free to swing downwardly under a weight without liability of being permanently distorted, and by which the springs will be held properly spaced and from tilting under the weight of the bar.

A further object of my invention is the provision of a connecting bar having novel means for the attachment thereto of spiral springs of bed structures and the like.

Another object of my invention is the provision of novel means for anchoring a spring supported bar to a support on which the springs supporting the bar are carried.

My invention further provides a spiral spring structure having novel means connecting the springs by which the springs are pivotally held and are free to swing downwardly under a weight without liability of becoming permanently distorted, and by which the springs are held from tilting under the weight of the connecting means.

The novel features of my invention are hereinafter fully described and claimed.

In the accompanying drawings which illustrate my invention,

Fig. 1 is a reduced plan view, partly broken away, of a spring bed bottom provided with my improvements.

Fig. 2 is an enlarged inside view of a portion of the top border angle bar, shown in Fig. 1, and portions of two spiral springs attached thereto by my improved method.

Fig. 3 is an under view of a portion of what is shown in Fig. 2.

Fig. 4 is a top view of what is shown in Fig. 3.

Fig. 5 is a section on the line 5—5 of Fig. 2.

Fig. 6 is an enlarged cross section of the angle bar shown in Fig. 5, as it appears prior to the forming of the partly severed depressed portion to engage with the inner side of a coil of a spring, part of which is shown in place for engagement with the angle bar.

Fig. 7 is a side elevation, reduced, of a portion of the angle bar shown in Fig. 2.

Fig. 8 is a reduced perspective view of a corner portion of the angle bar shown in Figs. 1 and 2, and three coils of springs attached thereto.

Fig. 9 is a cross section, enlarged, of a modification of the angle bar in which the depressed spring embracing portion is in the top flange, a portion of a coil of a spring being shown embraced thereby.

Fig. 10 is a reduced top view of a corner portion of a bar corresponding to the one shown in Fig. 9.

Fig. 11 is an enlarged perspective view showing a part of an angle bar corresponding to the form shown in Figs. 1 to 7 and operatively engaged with portions of two spring coils and with one of my improved stabilizer members, the latter being shown operatively engaged with parts which anchor it to the bottom bed bottom frame, a portion of which is shown.

Fig. 12 is an enlarged side view, partly in elevation and partly in vertical section of the parts shown in Fig. 11.

Fig. 13 is a reduced vertical section of a part of my improved stabilizer bar operatively engaged with an angle bar of the form shown in Figs. 1 to 7.

Fig. 14 is a reduced perspective view of a corner portion of another modification in which the angle bar is provided with associated pairs of partly severed depressed spring holding portions.

Fig. 15 is an enlarged inside elevation of a part of the bar shown in Fig. 14, showing two coils engaged by the angle bar.

Fig. 16 is a section on the line 16—16 of Fig. 15.

Fig. 17 is an under view of a part of the bar shown in Fig. 15, showing part of one coil attached thereto.

Fig. 18 is a top view, partly broken away, of what is shown in Fig. 17.

Fig. 19 is an under view of another modified form of my improved angle bar and parts of two coils attached thereto by partly severed depressed portions extending from the bar inside and under the coils.

Fig. 20 is a section on the line 20—20 of Fig. 19.

Fig. 21 is an under view of a part of another modified form of my spring holding bar in which pairs of partly severed depressed portions of the upper flange of the bar extend from said flange and the outer sides of the spring coils to the inner sides thereof, parts of two coils being shown so engaged.

Fig. 22 is a section on the line 22—22 of Fig. 21.

Fig. 23 is an under view of a part of an angle bar embodying another modification of my in-

vention, in which view a part of a coil is shown embraced by a partly severed portion of the bar extending downwardly from the top flange of the bar and engaging the inner and under side of the coil.

Fig. 24 is a section on the line 24—24 of Fig. 23.

Fig. 25 is an inside elevation of another modification of my improved spring holding bar, in which view an inwardly depressed partly severed portion of a flat bar embraces a downwardly extending offset of a coil of a spring.

Fig. 26 is a top view of what is shown in Fig. 25.

Fig. 27 is a section on the line 27—27 of Fig. 25.

Fig. 28 is a perspective view of a part of another modification of my invention, in which view parts of two spring coils are shown disposed flatwise against the under side of a flat bar which is provided with partly severed depressed portions which extend respectively into the coils and embrace the under and outer sides thereof.

Fig. 29 is a view similar to Fig. 28, and which embodies another modification of my invention, in which view parts of two spring coils are shown disposed flatwise against the under side of a flat bar which is provided with partly severed depressed portions which respectively extend under and upwardly and embrace the inner sides of the coils.

Similar characters of reference designate similar parts in the different views.

Referring to Figs. 1 to 8 and 11 to 13, 1 designates an angle bar embodying one form of my invention, which bar, as shown in Fig. 1, may be formed into a rectangular frame with its ends fastened together, with the top flange 2 extending inwardly from the vertical side flange 3.

The top flange 2 rests upon the outer sides of the top coils 4 of spiral springs 5, the lower coils 6 of which rest upon the upper edges of cross bars 7 attached at their ends to a bottom frame 8 of a seat or bed bottom, Figs. 1, 11 and 12.

The lower coils 6 are fastened to the bars 7 by a wire or rod 9 which bears on the upper sides of the coils 6 and engages the lower edge of the cross bars 7.

As shown in Figs. 2 to 8 and 11 and 12, the side flange 3 of the angle bar has inwardly depressed partly severed strip portions 10 of bow shape disposed in a longitudinal row, each strip 10 having its longitudinal edges spaced from and extending lengthwise of the flange 3. In attaching the springs 5 to the angle bar, the top coils 4 thereof are respectively inserted between the portions 10 and the upper flange 2 with the coils 4 disposed flatwise against the under side of the flange 2.

The portions 10 are then bent upwardly so as to embrace the under and inner sides of the coils 4, thus holding the latter pivotally against the inner sides of the flanges 2 and 3, with the portions 10 disposed from the flange 2 a distance less than the diameter of the wire of the coils 4. So connected to the angle bar 1, the top coils 4 may swing downwardly under a weight without liability of being permanently distorted thereby. The flange 2 holds the coils 4 from tilting upwardly above the horizontal. By bending the bow shaped strip 10 edgewise toward the flange 2 and into and against the coil 4 of the spiral spring, as shown in Figs. 2 and 5, an extremely strong spring holding means is produced, which is not liable to become distorted and weakened under severe usage, the coil 4 being held at two points closely adjacent to the ends of the bow strip and the latter being disposed edgewise to strains placed upon it by the spring.

In the modified form, shown in Figs. 9 and 10, the bow shaped portions 11, which correspond to the portions 10, are depressed downwardly from the top flange 2' of the angle bar 1', the top coils 4' of the coil springs being disposed flatwise against the under side of the flange 2', after which the portions 11, which are extended respectively downwardly into the coils 4', are bent outwardly toward the flange 3' so as to embrace the inner and under sides of the coils 4'. The coils 4' are thus pivotally connected to the angle bar 1' so as to be free to swing downwardly, and their upward movement is limited by the flange 2'.

For anchoring the angle bar 1 to the bottom frame of the bed bottom, there are provided at opposite sides of the bed bottom upwardly and outwardly inclined stabilizer members 12, each of which is provided at its upper end with an arcuate portion 13 which is pivotally engaged with an adjacent depressed portion 10 that holds the stabilizer portion 13 against the inner sides of the flanges 2 and 3, Figs. 11, 12 and 13.

The lower end of each stabilizer member 12 is provided with a loop 14 which pivotally engages the upper transverse portion of an inverted U shaped member 15 the lower ends of the arms of which are respectively pivoted in two oppositely disposed holes through two adjacent cross bars 7, whereby the member 15 and stabilizer member 12 can oscillate with the upper portions of the spiral springs 5 and the angle bar 1.

For normally forcing the stabilizer bars 12 outwardly, each bar 12 has fastened to it adjacent to its lower end one set of ends of two spiral springs 16, which extend outwardly and downwardly and are fastened at their other ends to the lower coils 6 of two adjacent springs 5. The tension of the springs 16 exerted on the stabilizer bars 12 normally forces the bar 1 and upper portions of the spiral springs 5 to positions in which the springs will stand erect, the axes of the oscillatory members 15 and the axes of the arcuate portions 13 of the bars 12 being parallel with each other.

As with some grades of steel from which the angle bars 1 are formed, the bow shaped depressions 10 can not be sufficiently depressed a distance great enough to cause the depressions to properly engage and hold the top coils 4, without having the length of the portions 10 too long, and without liability of breaking the depressed portions during the depressing and shearing operation, it is desirable, with such grades to substitute for the bow shaped portion 10 a pair of partly severed longitudinally alined and spaced portions 17, Figs. 14 to 18, which portions are first partly severed and depressed inwardly from the vertical flange 18 of an angle bar. The top coil 4 of the spiral springs 5 is then inserted between the portions 17 and the top flange 19 of the angle bar, with the coil 4 disposed flatwise against the under side of the top flange 19. The portions 17 are then bent upwardly so as to embrace the inner side of the coil 4 so as to hold it pivotally against the flanges 18 and 19.

It will be understood that a longitudinal row of such pairs of depressed portions 17 are provided for the attachment respectively thereto of the top coils of the adjacent spiral springs 5.

The portions 17 serve to pivotally embrace the coils 4 and the top flange 19 limits the upward movement of the coils 4 to prevent their upward

tilting above the horizontal due to the weight of the angle bar to which they are attached.

In the modification shown in Figs. 19 and 20, depressed partly severed portions 20 of the top flange 21 of an angle bar, are disposed in pairs arranged in a row, the portions of each pair being extended downwardly inside of an adjacent coil 4, and then extended longitudinally to embrace the under side of the coil, which is disposed flatwise against the under side of the top flange 21.

In the modified form shown in Figs. 21 and 22, partly severed portions 22 are depressed downwardly from the top flange 23 of an angle bar at the outer sides of the top coil 4, which is disposed flatwise at the under side of the flange 23, after which the portions 22 are bent longitudinally toward each other and against the under side of the coil 4.

In the modified form, shown in Figs. 23 and 24 a portion 24 is partly severed transversely from the top flange 25 of an angle bar, and is then depressed downwardly and outwardly toward the side flange 26, so as to embrace the inner and under side of a top coil 4 disposed flatwise at the under side of the top flange 25 of the bar, whereby the coil is pivotally held between the flanges and its upward tilting above the horizontal being limited by the top flange 25.

In the modification, shown in Figs. 25, 26 and 27, a flat bar 27, disposed edge up, is provided with an inwardly depressed partly severed portion 28 which pivotally engages the inner side and lower edge of a downwardly extending offset 29 of the horizontal top coil 30 of a spiral spring, the coil 30 being thus pivotally mounted and its upward tilting prevented.

In the modification, shown in Fig. 28, a flat bar 31 is provided with downwardly depressed transverse partly severed portions 32 which extend downwardly and engage the inner, under and outer sides of top coils 4 respectively, said coils being disposed horizontally flatwise against the under side of the bar 31 which is disposed horizontally flatwise. The coils 4 are pivotally mounted to swing downwardly by the portions 32, which, with the bar 31 holds the coils from tilting upwardly beyond the horizontal.

In the modification, shown in Fig. 29, a flat bar 33 is provided with downwardly depressed portions 34 which are partly severed and which engage the outer sides and the inner sides of top coils 4 respectively and pivotally attach the springs to the bar, so that the coils can swing downwardly but are held from upward tilting beyond the horizontal by the bar 33 against the under side of which the coils 4 are disposed flatwise.

I do not limit my invention to the structures shown and described, nor to the precise steps described for carrying my improved method into effect, as various modifications thereof than those described may be made without departing from the spirit of my invention.

What I claim is:—

1. The method consisting in cutting and inwardly depressing a portion of one flange of an angle bar to form a longitudinal strip having one of its ends joined to said flange and having both of its longitudinal edges spaced from and extending lengthwise of said flange, inserting a coil of a spring against one of said longitudinal edges and the other flange, and then bending said strip edgewise to a position in which it will grip and hold said coil against said flanges.

2. The method consisting in cutting and inwardly depressing a portion of one flange of an angle bar to form a bow shaped strip having its ends joined to said flange and having its longitudinal edges spaced from and extending lengthwise of said flange, inserting a coil of a spring against one of said longitudinal edges and the other flange, and then bending said strip edgewise toward said other flange and into said coil to a position in which the latter will be gripped and held by said strip against said flanges.

3. In spiral spring structures, an angle bar having at the inner side of one flange a depressed portion in the form of a longitudinal strip having one of its ends joined to said flange and having both of its longitudinal edges spaced from and extending lengthwise of said flange and bent edgewise toward the other flange, and a coil of a spring bearing against said other flange and against one of said longitudinal edges and gripped and held by the latter against said flanges.

4. In spiral spring structures, an angle bar having at the inner side of one flange a depressed portion in the form of a bow shaped strip having its ends joined to said flange and its longitudinal edges spaced from and extending lengthwise of said flange, and a coil of a spring bearing against the other flange and one of said longitudinal edges, said bow shaped strip extending into said coil and gripping it and holding it against said flanges.

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