

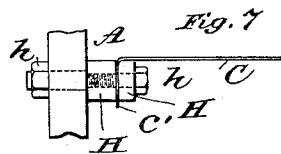
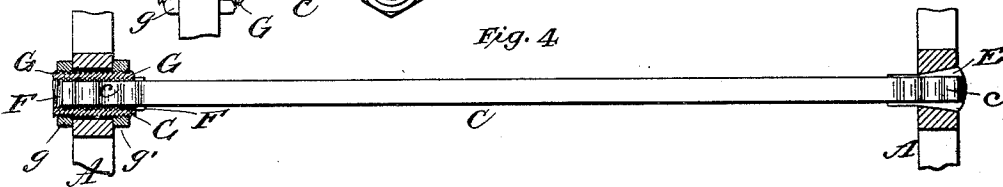
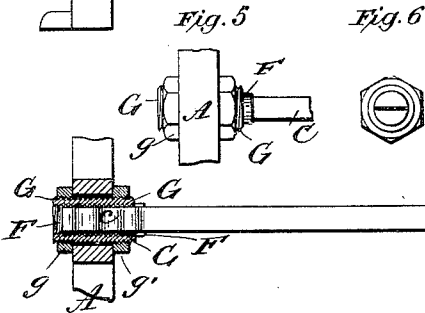
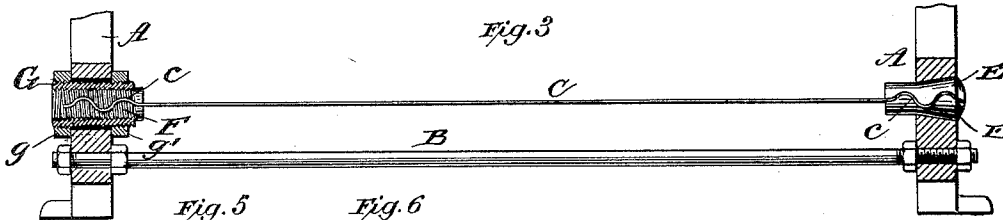
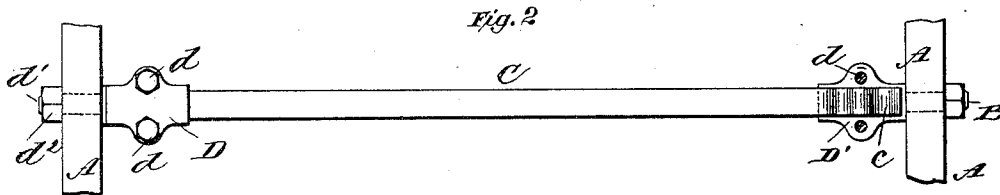
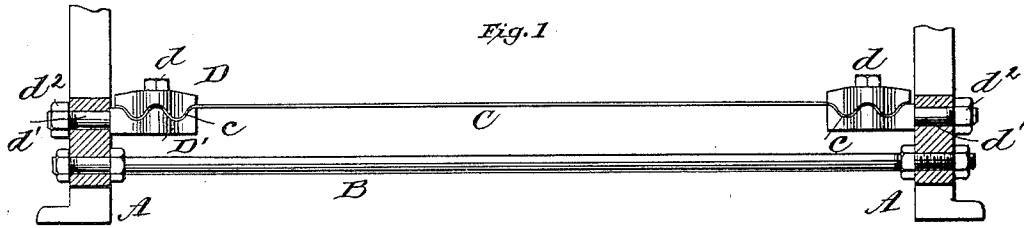
(No Model.)

C. N. WILCOX.

DEVICE FOR SECURING THE ENDS OF TORSION SPRINGS.

No. 467,843.

Patented Jan. 26, 1892.



Witnesses:

Raphael Netter
J. C. Ford

Inventor

Charles N. Wilcox

UNITED STATES PATENT OFFICE.

CURTIS N. WILCOX, OF BROOKLYN, NEW YORK, ASSIGNOR TO DEBORAH C. FOLK, OF SAME PLACE.

DEVICE FOR SECURING THE ENDS OF TORSION-SPRINGS.

SPECIFICATION forming part of Letters Patent No. 467,843, dated January 26, 1892.

Application filed September 1, 1890. Renewed July 7, 1891. Serial No. 398,671. (No model.)

To all whom it may concern:

Be it known that I, CURTIS N. WILCOX, of the city of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Devices for Securing the Ends of Torsion-Springs, of which the following is a specification.

My invention has been devised with more particular relation to the needs of an auxiliary-power mechanism of the kind set forth in my application for Letters Patent filed November 15, 1888, Serial No. 290,946; and it has reference to securing the ends of the tensioned torsion-spring which forms part of said mechanism.

It is my object to hold securely the ends of a tensioned flat torsion-spring against slipping or sliding under tensional strain and to provide means for doing this effectively without perforation or cutting of the spring. This result I attain by bending the ends of the spring out of line with the line of its tension and by holding these bent ends in clamps, which are adjustable the one to and from the other for the purpose of tensioning the spring, and are provided with meeting faces which match or fit closely upon the corresponding faces of the bent portions of the spring to which they are applied, and maintain these portions in a position where they are out of the line of tension to which that portion of the spring which extends between the clamps is subjected.

The nature of my improvements will be readily understood by reference to the accompanying drawings, in which I have represented several ways of carrying my invention into effect, all, however, embodying the general feature hereinbefore set forth as the characteristic of my invention.

Figure 1 is a front elevation, partly in section; and Fig. 2 is a plan of devices embodying the invention in one form. In Fig. 2 the upper half of the right-hand clamp has been removed. Fig. 3 is a sectional front elevation, and Fig. 4 is a sectional plan, of a modified form. Fig. 5 is a side elevation, and Fig. 6 is an end elevation, of the right-hand clamp in Figs. 3 and 4. Fig. 7 is a front elevation of still another modification.

A is the frame or support in which the torsion-spring C is tensioned.

B is the brace extending between the parts of the frame in which the spring is tensioned. In Figs. 1 and 2 the clamped ends of the spring are bent in waves or undulations *c*. The same is true of the spring in Figs. 3 to 6. In Fig. 7 the clamped end is bent nearly at right angles to the torsional part of the spring, as seen as *c'*; but in each case it will be noted that the ends of the spring are so bent that portions of them are out of the line of tension and that these bent portions are held in clamps, which match and fit closely upon them.

In Figs. 1 and 2 the clamp is composed of two superposed plates D D', having meeting faces which match the bent portion of the spring placed between them and held together by bolts and nuts *d* or equivalent means. One of the parts D' is formed with a threaded stem *d'* and nut *d''*, by which the clamp is held to the support A and by which also the spring may be tensioned.

In Figs. 3 to 6, which represent the specific clamping arrangement which I on the whole prefer, the right-hand clamp is a two-part one, the two portions E E' having meeting faces which fit upon the bent end of the spring placed between them and being tapered upon their exterior to form in effect a conical plug, for which a conical or tapered orifice or seat is formed in the support A. When the clamp E is placed in this orifice and the spring is tensioned from the other end, the clamp will be drawn into its seat, so as to clasp the bent end of the spring most tightly. The left-hand clamp F in Figs. 3 to 6 is also a two-part tapered plug; but its taper is trifling and only sufficient to insure that its two parts shall be closed tightly upon the bent end of the spring when the case G is screwed onto it. For this purpose the plug F is externally screw-threaded and the case G is internally screw-threaded, as shown. The case G passes loosely through the support A and is held therein by nuts *g g'*, which screw upon its screw-threaded ends on opposite sides of the support. The inner nut *g'* serves merely as a check-nut. The outer nut *g* is

used to tension the spring by drawing the case G outwardly through the support A.

In the clamps thus far described the meeting faces are horizontal.

5 In the clamp shown in Fig. 7 the meeting faces of its two parts H H are vertical to match the bent end *c'* of the spring which is between them, and these two parts are held together and to the frame A by bolts and nuts
10 *h*, as shown.

Having now described my invention and the manner in which the same may be carried into effect, what I claim herein as new, and desire to secure by Letters Patent, is—

15 1. The combination of the supporting-frame, the flat torsion-spring having its ends bent out of the line of its tension, and the clamps secured to the frame and adjustable therein, the one to and from the other for the
20 purpose of tensioning the spring, and provided with meeting faces which match the bent ends of the spring received and held between them and maintain the same in a position where they are out of the line of tension
25 to which that portion of the spring which extends between the clamps is subjected, as hereinbefore set forth.

2. The combination of the supporting-frame, the flat torsion-spring having its ends
30 bent in waves or undulations *c* out of the line

of its tension, and clamps secured to the frame and adjustable therein, the one to and from the other for the purpose of tensioning the spring, and provided with waved meeting faces to match the portions of the spring received and held between them and to maintain these portions in a position where they will be out of the line of tension to which that part of the spring which extends between the clamps is subjected, as hereinbefore set forth. 35 40

3. The combination of the torsion-spring, the two-part clamp F, the case G, the frame A, and means for adjustably securing the case to the frame, substantially as and for the purposes set forth. 45

4. The combination of the frame, the torsion-spring, the tapered two-part clamp E for one end of the spring seated in a tapered orifice in the frame, the two-part clamp F for the other end of the spring, the case G, and
50 means for adjustably securing the case to the frame, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 29th day of August, 1890.

CURTIS N. WILCOX.

Witnesses:

J. E. FOLK,
M. E. HATCH.