

No. 730,585.

PATENTED JUNE 9, 1903.

J. V. E. THIOLLIER.

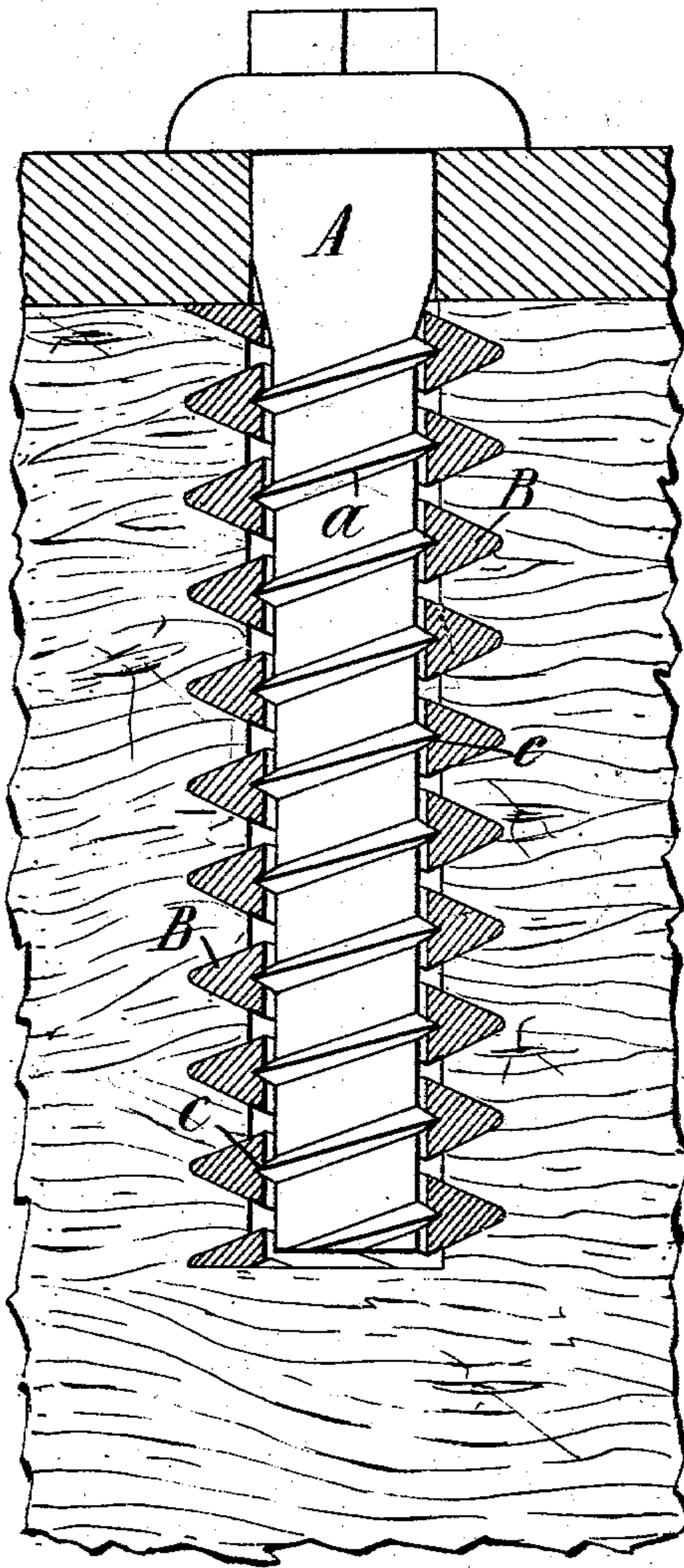
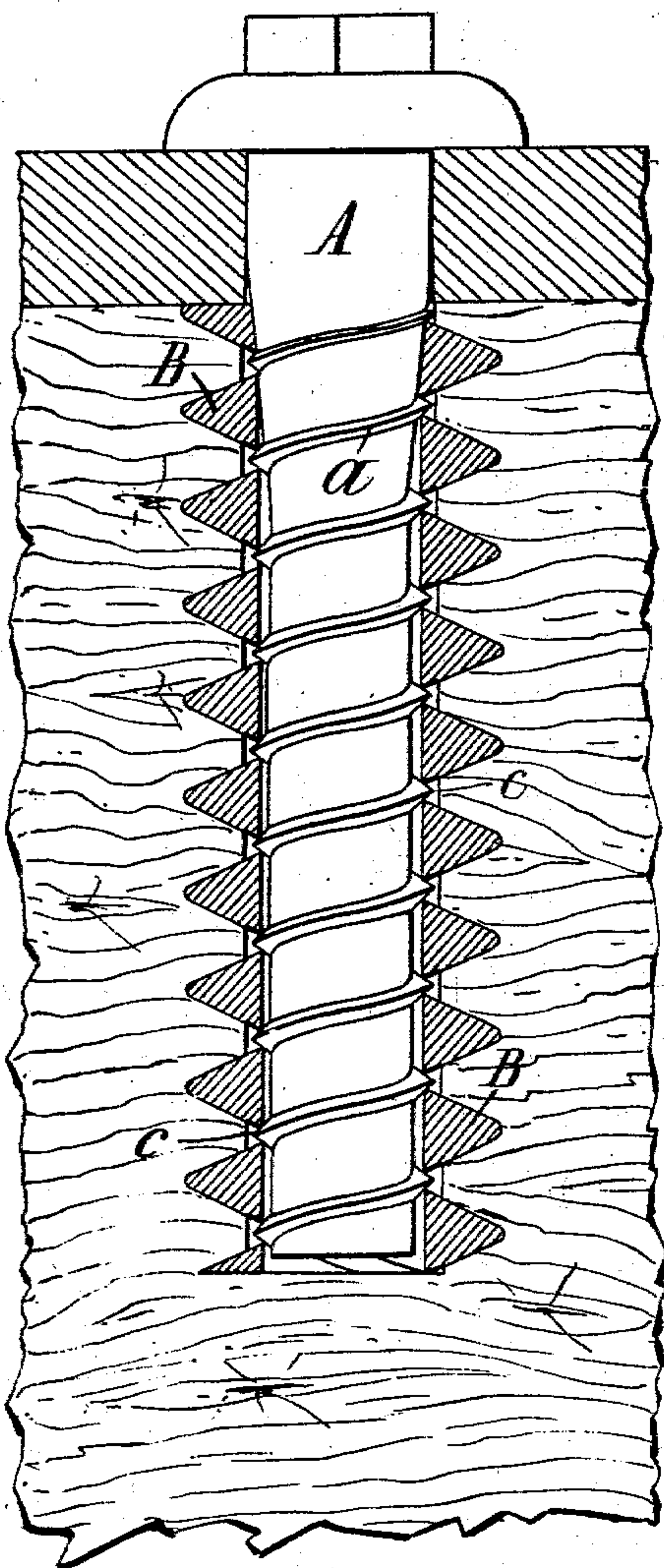
MEANS FOR FIXING BOLTS, SCREWS, OR SIMILAR ARTICLES IN  
SOFT SUBSTANCES, SUCH AS WOOD.

APPLICATION FILED AUG. 21, 1901.

NO MODEL.

*Fig. 1.*

*Fig. 2.*



WITNESSES

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# UNITED STATES PATENT OFFICE.

JEAN VINCENT EMMANUEL THIOLLIER, OF PARIS, FRANCE.

MEANS FOR FIXING BOLTS, SCREWS, OR SIMILAR ARTICLES IN SOFT SUBSTANCES, SUCH AS WOOD.

SPECIFICATION forming part of Letters Patent No. 730,585, dated June 9, 1903.

Application filed August 21, 1901. Serial No. 72,766. (No model.)

*To all whom it may concern:*

Be it known that I, JEAN VINCENT EMMANUEL THIOLLIER, a citizen of the French Republic, residing at 58 Rue de Lourmel, Paris, in the Republic of France, have invented a new and useful Improved Means for Fixing Bolts, Screws, or Similar Articles in Soft Substances, such as Wood, of which the following is a specification.

The present invention relates to a method of fixing bolts and screws in soft substances, such as wood, whereby greater and more permanent security is obtained. I will take, for example, the fixing of chairs on railway-sleepers, which is a most important application under the most unfavorable conditions. The fixing of the chairs on wooden sleepers by the help of screws or bolts or cramp-irons driven into these sleepers is subject to disadvantages well understood. The wood, split by the forcible insertion of the bolts, gives a comparatively feeble hold for the screws, and this hold is further weakened in a little time, owing to the shakings and shocks undergone by the chair and the action of the wet which rots the wood. Under these conditions the chair is no longer of any use, and it has to be raised and secured in another place alongside. Attempts have been made to lessen this evil by replacing old wood by new wood—that is to say, by forcing into the hole in the sleeper previously cleaned and enlarged a hard wooden bush of which the inside diameter is that of the original hole and which is intended to receive the bolt or screw; but this means, though costly, is only a makeshift and lasts but a limited time.

My system consists in placing between the bolts and the sides of the hole in the piece of wood with which it is to be engaged a metal protection consisting of a band or rod of metal wound into a coil. The chair bolt or screw is thus enveloped throughout its length, or almost so, by the aforesaid coil. Under these conditions it is no longer the bolt or screw which is in contact with the wood, but the coil of metal, whose hold on the wood is determined by the impulse to expand, which it receives from the inserted screw or bolt.

Figure 1 of the accompanying drawings shows one embodiment of my invention partly in elevation and partly in section. Fig. 2 is

a sectional elevation of another embodiment of the invention wherein the elastic coil is provided with an internal or female fine groove adapted to receive the male thread of a bolt or screw.

A is a chair-bolt engaging with a piece of wood by the aid of the coil B. To fix a screw in this manner, the operator commences by boring a hole in the piece of wood, which hole is then tapped with a thread in which engage the spirals of the coil B. This coil is now placed in position, and the screw A is made to engage with it, the thread *a* of said screw engaging in the space between the coils of the spiral, as shown by Fig. 1, or said threads of the screw may engage with a fine groove which is provided in the coils of the spiral, as shown by Fig. 2, said groove being especially provided in the coil B for the reception of the threads on the bolt.

In the manufacture of my improved bolt-holding coil B, I employ a strip of metal which is of triangular form in cross-section, as shown by the drawings, and this coil is bent by any suitable means into a helix of uniform diameter throughout its length, the members of the metallic strip being arranged so as to bring their edges close together and to thereby present their flat surfaces inside of the elastic coil in a manner to allow the internal or female groove *c* to be formed on the interior of said coil. This internal groove or female thread *c* of the coil is adapted to have the male threads on the bolt engage therewith when said bolt is screwed into the coil, as shown by Fig. 2. The threaded bolt is of such size that it will force the coil and thereby expand the latter within the work, whereby the coarse male threads of the coil will be embedded firmly into the wood, so as to effectually prevent any displacement of the coil or of the bolt which is in engagement therewith. The internal groove of the coil B may be said to form a fine or internal thread, the size of such fine thread being considerably smaller than the coarse external or male threads of the bolt. The coil is made to expand by the insertion of the bolt or screw, so that its members will be pressed firmly against the wood. It is to be understood that the coil is made with a pitch corresponding to that of the thread on the screw or bolt. By



this construction the force that the screw A receives is transmitted to the piece of wood elastically, uniformly, and over a considerable surface, which prevents all possibility of splitting or tearing the coil and the bolt away from the wood.

With a screw or bolt which is engaged directly with the wood contact between the bolt and the embedding material is very imperfect by reason of the tearing of the fibers of the wood and the roughness of the wall of the hole which is bored therein by an auger. In this case the shocks and vibrations received by the chair-bolt are entirely and rigidly transmitted by it to the wood, and this rapidly breaks up the latter. On the contrary, the use of my improvements allows the shock received by the chair-bolt to be transmitted to an elastic body—i. e., the coil. This coil absorbs the shock and vibration partially and the strain tends to increase the diameter of the coil which holds itself forcibly to the wood, transmitting to the latter the remainder of the shock and vibration and also spreading it over a considerable surface. Under these conditions the wood cannot become damaged or torn and the operator can remove and replace the bolt or screw an indefinite number of times without tearing out the wood, which with the ordinary means of engaging the bolt can only take place a very few times.

It is evident that a bolt which is threaded for only a part of its length may be employed.

I have taken as an example of the system its application to chair-bolts; but it is to be understood that the improvements are applicable to all forms of cramps, bolts, screws, and similar devices which are required to engage with a soft substance, said device constituting a screw in the general sense of the word.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a device of the class described, an expansible elastic coil provided with a coarse male thread adapted to be embedded in a wooden or other soft body, combined with a bolt screwed into said coil to expand the lat-

ter and displacing the male threads thereof to compress the fibers of a soft material in which they are embedded; the normal internal diameter of the elastic coil at its bolt-engaging portions being less than the diameter of the bolt which is screwed therein at its engaging portions.

2. In a device of the class described, an expansible and elastic coil having a female thread and a coarse male thread, the latter adapted to be embedded in wood or other soft material, and a threaded shank having its male threads engaging with the female threads of the coil and displacing the convolutions of the latter by expanding the same and forcing its male threads to compress the fibers of the soft material in which they are embedded, the normal internal diameter of the coil at its shank-engaging portions being of less diameter than the diameter of the shank at the coil-engaging portions thereof.

3. In a device of the character described, the combination with a male-threaded bolt or shank, of an elastic enveloping coil expanded by engagement with said bolt or shank, the members of said coil forming a coarse male thread which are forcibly displaced by the action of the bolt and are adapted to compress the fibers of a surrounding body of wood or other material, the normal internal diameter of the coil at its shank-engaging portions being of less diameter than the bolt at the coil-engaging portions thereof.

4. In a device of the class described, an elastic coil formed by a cross-sectionally triangular strip which is bent into a helix of uniform diameter, the members or convolutions of said strip having their edges closely arranged and provided with an internally-threaded groove, the external faces of said members or convolutions presenting a coarse male thread.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JEAN VINCENT EMMANUEL THIOLLIER.

Witnesses:

GUSTAVE DUMONT,  
EDWARD P. MACLEAN.