(No Model.)

W. M. WOTTON.

NUT LOCK.

No. 441,224. Patented Nov. 25, 1890.

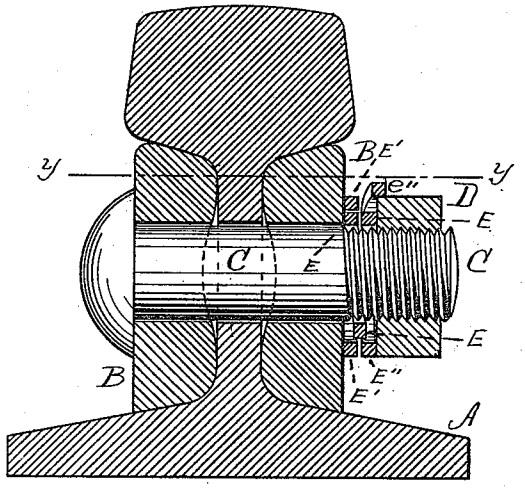


Fig. 1.

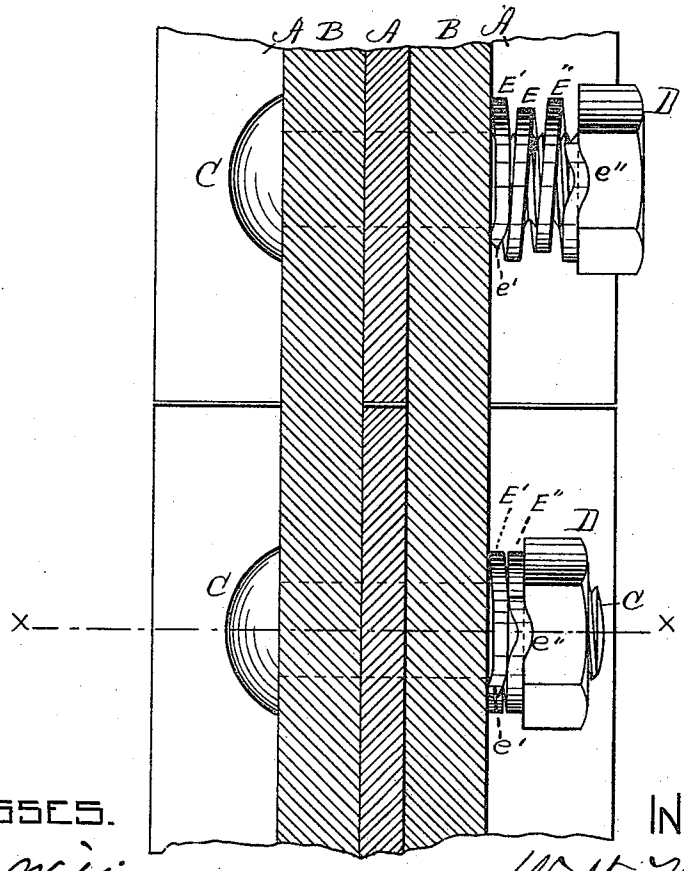


Fig. 2.

WITNESSES.

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WALTER M. WOTTON, OF DOVER, MASSACHUSETTS.

NUT-LOCK.

SPECIFICATION forming part of Letters Patent No. 441,224, dated November 25, 1890.

Application filed May 5, 1890. Serial No. 350,692. (No model.)

To all whom it may concern:

Be it known that I, WALTER M. WOTTON, of Dover, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Nut-Locks, of which the following is a specification.

This is a device for locking a nut which has been turned up into position, and is especially, though not exclusively, adapted for use in connection with nuts applied to bolts which pass through a railway-rail and fish-plates.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a cross vertical section of a railway-rail and fish-plates with my nut applied, the section being taken on line *x*, Fig. 2. Fig. 2 is a horizontal section on line *y*, Fig. 1, in which two nuts are shown, one about to be tightened and locked and the other already screwed up into position and locked by my device.

A represents a common railway-rail; and B B the fish-plates.

C is an ordinary bolt, and D a nut, made in the usual manner.

My improved nut-lock consists of a spiral spring made of wire, preferably square in cross-section, and consisting, essentially, of a little more than three coils, the central coil E being smaller in diameter than the outer coils E′ E″, so that the spring is practically a double helical spring. The end of the lower coil E′ is bent down slightly at *e′*—say at an angle of forty-five degrees, or thereabout—and is left square or with sharp edges, being unfinished and not rounded off in any manner, and the end of the upper coil E″ is provided with a convolution or inverted V or wave *e″*, extending upward, as shown, such wave or inverted V being complete and finished before the actual end of the wire is reached. The broad bend or convolution *e″* thus forms an approximately flat bearing or locking face, which projects over and rests across the surface of any one of the facets of the nut. This bearing-face *e″* is therefore formed on the plane of the circumference of the spring, as is also the sharp point *e′*, and the spring is thus adapted to be mounted upon the bolt. It will be noted that the sides of the inverted V or wave *e″*, which engages the corners of the nut during the revolution of the latter, are preferably curved or inclined to facilitate the passage of the corner of the nut, and that the end portion of the lower coil E′ preferably inclines upwardly to facilitate the engagement and operation of the point *e′* with relation to the surface B, as clearly shown in Fig. 2. This spring is placed on the bolt C before the nut is applied. When the nut is screwed onto the end of the bolt, the under side of the nut presses against the upper coil E″, and the surface of the fish-plate B is in contact with the under coil E′. (See Fig. 2.) As the nut is screwed up, the bend or convolution *e″* slips under it at the corners and over the surface at the facets. As the nut continues to be screwed on, the central coil disappears within the outer coils until, when the nut is screwed fully up, the central coil E is entirely out of sight, the outer coils E′ E″ only showing, and being pressed together. The bend or convolution *e″* is projecting up over and next one of the facets of the nut, and the bent end *e′* is digging into the surface of the fish-plate. (See Figs. 2 and 3.) By reason of the shape of the spring, the smaller diameter of the central coil, and the natural spring in the length of wire comprising the convolution *e″* this convolution will continue to dip under the corners of the nut until the upper and lower coils are jammed tightly against each other at every point, and then its side or flank will hug one of the facets, as mentioned. It will be noted that in the herein-shown construction of the spring the upper and lower coils of approximately corresponding diameters and the middle or central connecting-coil of less diameter than the outer coils are formed by continuous convolutions of the wire, diminishing in diameter from each end toward the center of the spring, whereby when the spring is set the central connecting-coil is inclosed by the outer operating-coils, and the two latter bear closely together. It will readily be seen that in order that the nut may become loosened the bend *e″* must be pushed down under a corner of the nut, or the end *e′* must be pushed along the surface of the fish-plate, neither of which is likely to occur, as considerable force would be required

to jam the bend e'' under a corner of the nut, and the end e' from the shape of its angle is digging into the very substance of the fish-plate.

I am of course aware that a helical and double-helical spring are not new, the same having been used in many connections. I am aware, also, that a spiral-spring washer or nut-lock has been constructed having bulbous projections at its ends adapted to fit and drop into correspondingly-shaped concave depressions in the nut and lock-bar; but it is the intention in my invention to make no alterations in the nut, rail, bolt, or fish-plate. Hence the inner end of my spring is bent slightly and left sharp for the purpose above named, and the outer end is bent into the convolution described.

I am aware, also, that a leaf-spring has been interposed between a nut and fish-plate, said spring consisting of a plate bent into the folds which are perforated to receive the bolt, and the upper fold being provided with a turned-up edge to prevent the nut from turning. (See United States Patent No. 344,380.) I do not claim any of the constructions above referred to.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The herein-described improved nut-lock, comprising a double-helical spring coiled from spring-wire and having a lower and upper coil of approximately corresponding diameters, and a middle or central connecting-coil of less diameter than the outer coils, these coils being formed by continuous convolutions of the wire, diminishing in diameter from each end toward the center of the spring, whereby when the spring is set the central connecting-coil is inclosed by the outer operating-coils and the two latter bear closely together, the lower coil having its end turned downwardly and forming a sharp point, which engages and enters the adjoining surface, and the upper coil having a broad bend or wave e'' at its end portion, forming an approximately flat bearing-face, which projects over and rests across one of the facets of the nut, substantially as set forth.

2. As an improvement in nut-locks, the combination, with the bolt and with the bearing-surface B, of the double-helical spring coiled from spring-wire and having a lower and upper coil of approximately corresponding diameters, and a middle or central connecting-coil of less diameter than the outer coils, these coils being formed by continuous convolutions of the wire, diminishing in diameter from each end toward the center of the spring, whereby when the spring is set the central connecting-coil is inclosed by the outer operating-coils and the two latter bear closely together, and an ordinary nut D, the lower coil E′ of the spring having its end turned downwardly and forming a sharp point e', engaging the substance of the bearing-surface B, and the upper coil having a broad bend or wave e'', forming a bearing-face projecting over and resting across one of the facets of the nut, substantially as set forth.

WALTER M. WOTTON.

Witnesses:
JAMES H. WIGHT,
E. P. MOORE.