

J. B. ATWOOD.
Nut-Locks.

No. 148,646.

Patented March 17, 1874.

Fig. 1.

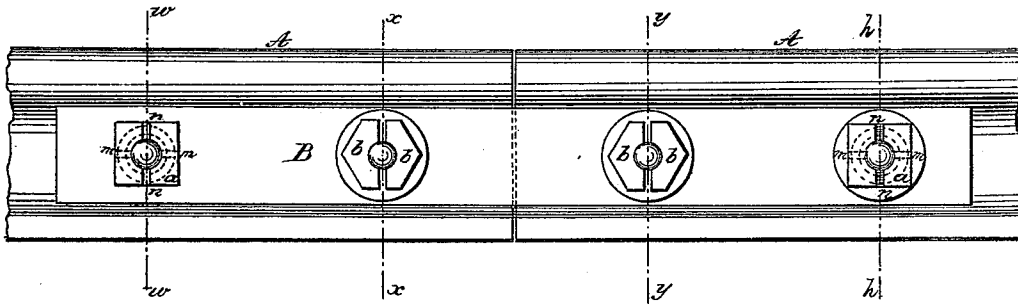


Fig. 2.

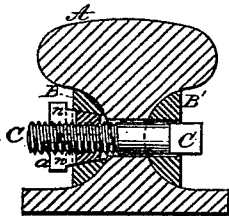


Fig. 3.

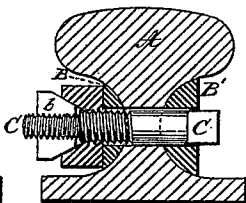


Fig. 4.

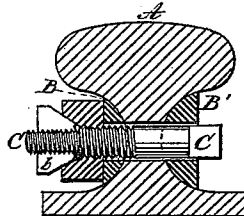


Fig. 5.

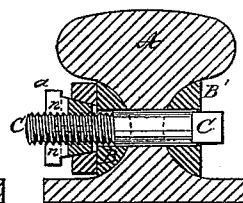


Fig. 6.

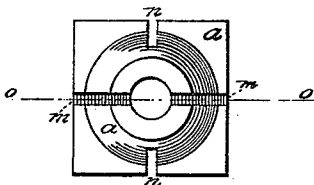


Fig. 7.

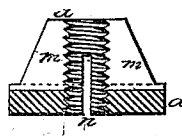


Fig. 8.

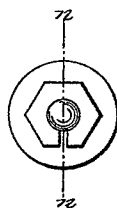
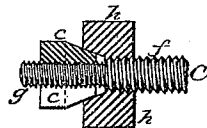


Fig. 9.



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UNITED STATES PATENT OFFICE

JAMES B. ATWOOD, OF WILBRAHAM, MASSACHUSETTS.

IMPROVEMENT IN NUT-LOCKS.

Specification forming part of Letters Patent No. 148,646, dated March 17, 1874; application filed January 12, 1874.

To all whom it may concern:

Be it known that I, JAMES B. ATWOOD, of Wilbraham, in the county of Hampden and State of Massachusetts, have invented certain Improvements in Nut-Locks, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of a railroad fish-plate joint having my improved nut-lock applied thereto. Fig. 2 represents a transverse vertical section, taken through the line *ww* of Fig. 1; and Figs. 3, 4, and 5 similar sections, taken through the lines *xx*, *yy*, and *zz*, respectively. Fig. 6 represents a plan of the under side of one of the improved nut-locks; and Fig. 7, a vertical section of the same, taken through the line *oo* of Fig. 6. Fig. 8 represents a plan of a modification of my improvement; and Fig. 9 a vertical section, taken through the line *nn* of Fig. 8.

My invention relates to a new and improved mode of constructing and applying self-locking nuts; and it consists in so making them that, when used in connection with a conical-shaped recess made in the article to be secured, or in a correspondingly countersunk washer or nut, the nut, as it is screwed up and tightened, will be made to powerfully compress or clamp the thread of the screw-bolt on which it is screwed, and that throughout the whole thickness of the nut. For this purpose the nut is cut nearly in two from the bottom upward, and in a line at right angles to its face, and through the middle of the nut, and a similar cut made from the top nearly to the bottom, but in a transverse direction to the other. Secondly, it consists in combining, with a nut having a slit or slits, and a conically-shaped end, another nut having a corresponding conically-shaped recess, and each nut provided with a screw-thread, either of different or of reverse pitch when such are used in connection with a screw-bolt having corresponding threads for each of the nuts. In this case the conical nut may be split in two or more parts, so that it may be fitted around the screw-bolt inside of the conical recess, and thereby save much labor and time in screwing the bolts tight, while the parts of the nut will be thereby held securely in place. By this plan it will be apparent that the screw-bolt would thereby be

so firmly secured in place that it could not be loosened by any amount of jarring or vibration of the parts secured, and this is true whether the conical nut is split entirely or partially in two, or only on one side.

To enable others skilled in the art to make, construct, and use my invention, I will now proceed to describe its parts in detail.

The improved nuts are represented as being applied to a fish-plate joint of two adjoining rails of a common railroad way, in which *A* represents the rails, and *B B'*, the two fish-plates, one of which, *B'*, is represented as being provided with a longitudinal groove, *x*, formed throughout its whole length, into which is fitted the screw-bolt head, to prevent its turning.

The slot may be of a width sufficient to receive the ordinary square head of the screw-bolt *c*, or it may be made narrower, in which case the bolt-head may be made long and narrow, such as is represented in the various sectional views.

The other fish-plate, *B*, if washers or extra nuts are not intended to be used in connection with my improved nuts, is provided at each bolt-hole with a conical recess or countersink, of a size and shape corresponding to the conical end of the improved nut, as shown in Fig. 2; but when the washer or extra nut is intended to be used, it need not then be provided with the countersink or conical depression before referred to, but be made simply as shown in Figs. 4 and 5—that is to say, with a hole of a size sufficient to receive the bolt.

In Fig. 1 are shown two forms of my improved nut-lock system, and each applied in two different ways, and as more particularly illustrated in Figs. 2, 3, 4, and 5; while yet a third form is shown in Figs. 8 and 9, in which the conical nut is provided with a single slit, and applied to the bolt and to the fish-plate in connection with a second nut. In this latter case the screw-bolt *c* is provided with two threads of different pitch, and so with the nuts, just as in Fig. 4; the inner thread, *f*, having the greater, and outer thread, *g*, the less pitch. The inner nut, *h*, is provided with a conical recess or depression, and the outer nut, *e*, with the corresponding conical point.

By this arrangement, it will be apparent

that the inner nut cannot possibly turn, because of the pitch of its thread being greater than the pitch of the thread of the outer nut *c*; while the outer nut cannot turn because of its compression upon the thread of the bolt, caused by the slit or slits in its side, and the action thereon of the conical recess of the inner nut when the former is screwed tightly in place.

In the drawing, Figs. 8 and 9, the outer nut, *c*, is represented as having only one slit from top to bottom, and which, in this connection, will answer a very excellent purpose, as the vibratory action of the rails is less felt on the outer than on the inner nut, *h*; but would not answer so good a purpose were it used in connection with a simple washer, provided with a conically-shaped depression, as the vibration on the latter would be extended directly to the former, and in time loosen both, as the turning of the washer would be exerted on the nut without exerting any special strain on the thread of the nut and bolt; but while such answer a very excellent purpose, as before stated, in some respects, I prefer to use in connection with the inner nut, *h*, the nuts *a* or *b*, the particular construction of which I will hereafter describe.

In using the two nuts having threads of different pitch, the end of the bolts on which the threads are cut may be made in either of two ways—that is to say, with the threads running in the same or in opposite directions. If the latter, the pitch need not necessarily be different; if the former, they must be. In either event, the end of the screw-bolt on which the two threads are cut must be of different diameters—that of the outer end being the less, and the inner part the greater, and the thread of the greater pitch then cut on the greater diameter, and vice versa.

The nut *a* is cut nearly in two in two different directions—that is to say, it is provided with a slit or cut, *m*, from the bottom or conical end upward toward the top, as shown at line *o o* of Fig. 6, and with another slit, *n*, from the top toward the bottom, as shown in Fig. 7. These two cuts intersect each other, and allow the sides of the nut, as screwed up in the conical recess of the fish-plate, washer, or nut, to

be forced together all along the line of the bolt, and thus clamp the latter throughout the whole thickness of the nut.

The nut *a* may be made with only one slit, *m* or *n*, when used in connection with another nut having a reverse thread or thread of different pitch; but it is deemed better to combine that slit with the upper slit *n*. (See Figs. 1, 3, and 4.)

The nut *b* is represented as being divided into two parts, although it may be made in three or four parts; but as a rule, two is considered as sufficient. This, like the nut *a*, as the two parts are forced together on screwing it up in the recess, is made to compress the nut and clamp the thread throughout its whole thickness, and possesses the additional advantage of being fitted around the bolt in the recess, and thereby requiring but few turns to tighten it, instead of, as in the others, of having to commence screwing it on at the end of the screw-bolt.

It will be evident that my improved nuts and nut-lock system may be applied to any objects requiring to be secured together; but are especially adapted to bolts subjected to a vibrating or jarring action, and which is imparted to them through the objects secured together.

Having described my invention, what I claim as new, is—

1. A conically-shaped nut, having one or more of each of slits *m* and *n*, the inner ends of which are made to intersect each other in the manner substantially as described, and for the purpose set forth.

2. A conically-shaped nut, provided with one or more slits, or made in two or more parts, in combination with another nut, *h*, having a correspondingly-shaped recess or depression, and each provided with a thread cut reversely to the other, or a thread of different pitch, substantially as described, and used in connection with a screw-bolt provided with corresponding threads, for the purpose set forth.

JAMES B. ATWOOD.

Witnesses:

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HUGH ROCKETT.