

(No Model.)

T. GARE.

MACHINE FOR MAKING COILS FOR LOCK-NUTS.

No. 561,579.

Patented June 9, 1896.

Fig. 1.

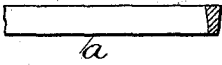


Fig. 3.

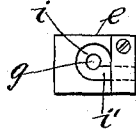


Fig. 4.



Fig. 2.

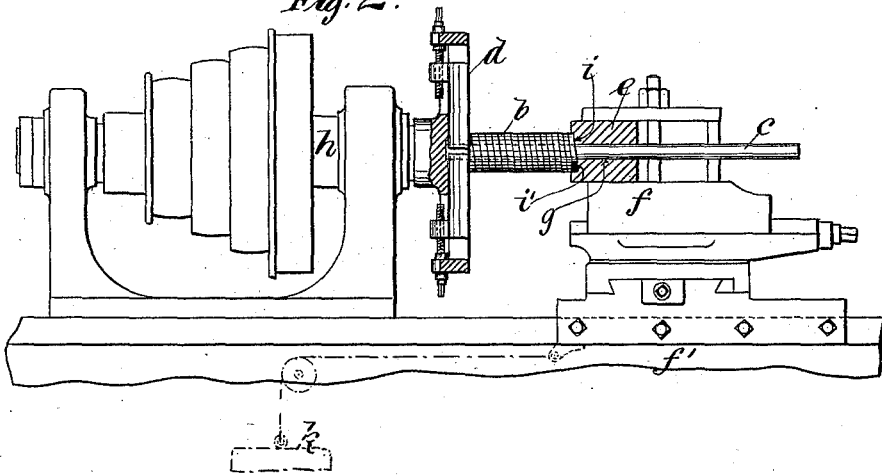


Fig. 5.

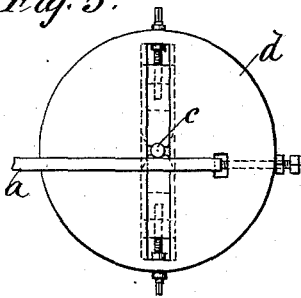


Fig. 6.

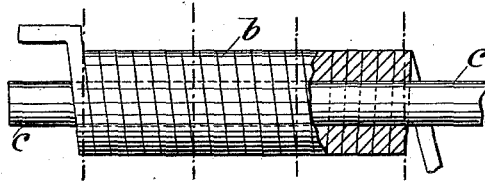


Fig. 7.

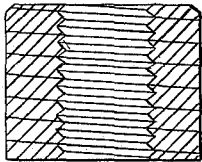


Fig. 8.

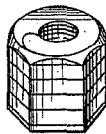


Fig. 9.

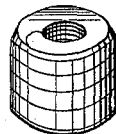
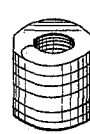


Fig. 10.



Witnesses.  
Alfred Rosshardt  
Stanley Bramall

Inventor.  
Thomas Gare  
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Attorney.

# UNITED STATES PATENT OFFICE.

THOMAS GARE, OF STOCKPORT, ENGLAND, ASSIGNOR OF ONE-HALF TO  
THOMAS SEPTIMUS HARDEMAN, OF MANCHESTER, ENGLAND.

## MACHINE FOR MAKING COILS FOR LOCK-NUTS.

SPECIFICATION forming part of Letters Patent No. 561,579, dated June 9, 1896.

Application filed October 25, 1892. Renewed April 16, 1894. Serial No. 507,776. (No model.) Patented in England November 3, 1887, No. 14,985, and in Germany March 26, 1889, No. 46,364, and January 9, 1894, No. 72,892.

To all whom it may concern:

Be it known that I, THOMAS GARE, a subject of the Queen of Great Britain, residing at Stockport, in the county of Chester, Kingdom of Great Britain, have invented new and useful Improvements in Lock-Nuts and Mechanism for Making the Same, of which the following is a specification.

The invention has been patented in Germany, No. 72,892, dated January 9, 1894, and No. 46,364, dated March 26, 1889, and in England, No. 14,985, dated November 3, 1887.

This invention relates to improvements in and connected with the manufacture of lock-nuts, and has for its object to provide means whereby lock-nuts can be produced at a quicker and cheaper rate and the same are rendered more secure and may serve as ordinary nuts. I attain this object by the means illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of a metal bar or strip from which the lock-nuts are made. Fig. 2 is an elevation, partly in section, of the lathe and former or guide employed in the coiling of the nuts. Fig. 3 is an end view, and Fig. 4 a side view, of the former or guide. Fig. 5 is a side view of the chuck or face-plate of the lathe. Fig. 6 is an elevation of a nut-coil as received from the lathe. Fig. 7 is a section of a finished nut. Figs. 8, 9, and 10 are perspective views of various forms of nuts.

Similar letters refer to similar parts throughout the several views.

In carrying out my invention I use a metal bar or strip *a*, (see Fig. 1,) of such taper section that will cause each coil to fit tightly against the preceding one throughout its diameter and form a hollow elastic body or coil *b*, (see Fig. 6,) which has a solid appearance.

The degree of taper the metal bar or strip *a* must possess is chosen in proportion to the interior diameter of the nut desired. The smaller the latter the greater is the lateral expansion of the narrow edge of the bar or strip *a* in being coiled.

The closing of the coils *b* throughout their diameter is due to the taper section of the metal bar or strip *a*, as it provides a space for

the narrow edge of the bar or strip to expand 50 laterally on being wound without causing the coils to part externally, as would be the case if a straight section of metal bar or strip were used.

The coiling of the metal bar or strip I perform in a lathe or similar tool, (see Fig. 2,) on a mandrel *c*, having a diameter equal to the internal diameter of the coil to be wound, one end of which mandrel *c* is fixed into a chuck or face-plate *d* and the other carried 60 by a former or guide *e*, fixed on the slide-rest *f*, and having a hole *g* for the said purpose concentric with the head-stock spindle *h*.

The side of the former or guide *e* nearest the chuck or face-plate *d* has a recess or groove 65 *i* *i'*, partly circular and concentric with the hole *g* and partly straight, the circular portion *i* in diameter corresponding with the outer diameter of the coil to be wound and in section as well as the straight portion *i'* with 70 that of the metal bar or strip *a*.

On the slide-rest *f*, with its former or guide *e* having been placed against the chuck or face-plate *d*, one end of the metal bar or strip *a* to be coiled is passed through the straight recess or groove part *i'* with its narrow edge upward underneath the mandrel *c*, and is then suitably secured to the chuck or face-plate *d*, (see Fig. 5,) as may be found most convenient.

On the lathe being set in motion the mandrel *c* and fixed end of the metal bar or strip *a* rotate, draw the latter through the straight recess or groove part *i'* in the former or guide *e*, and coil it on its narrow edge onto the mandrel *c* and into the circular recess or groove *i*, pressure being longitudinally exerted on the coil by the former or guide *e* either through friction between the slide-rest *f* and its bed *f'* or by the pull of a weight *k*. After coiling 90 the metal bar or strip *a*, as described, the coil is cut straight at each end and crosswise at distances equal to the depth of the nut desired, as shown in dotted lines, Fig. 6, and afterward placed into a milling or similar machine, as will be well understood, for the purpose of shaping it externally, either square, hexangular, or octangular, or mill- 95

ing it as may be required for different shapes of nuts. (See Figs. 8, 9, and 10.)

The number of threads and coils a nut must possess to be secure and yet easily removable are also in certain proportion to the diameter of the bolt for which the nut is used—viz., for a three-fourths-inch bolt a nut having six coils and eight threads will give the best results. This nut is placed onto the bolt by gripping its bottom coils and removed by gripping its top coils with a spanner. The action of the two ends on the bolt being opposite a portion of the nut is each time slightly expanded, and thus the placing and removal of the nut facilitated.

When forming the said nuts of steel, they may be tempered if deemed necessary.

The internal diameter of the nut I make slightly smaller than the thread to which it is applied, in order to cause the nut to expand a little on being placed on the thread and thus grip more tightly.

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

1. A lock-nut consisting of a bar of tapered section coiled so that each coil completely rests against and supports the adjacent coil on the whole of its surface, and screw-threaded internally, said coils being capable of slight diametrical as well as longitudinal expansion, substantially as described.

2. In combination, a chuck, a mandrel held thereby and a sliding former or guide encircling the mandrel and provided with a straight recess or opening *i'* of taper shape and a curved recess *i* forming a continuation of the recess *i'*, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

THOMAS GARE.

Witnesses:

ALFRED BOSSHARDT,  
STANLEY E. BRAMALL.