(No Model.)

# F. G. STARK.

## NUT.

No. 327,612. Patented Oct. 6, 1885.

Fig: 3.

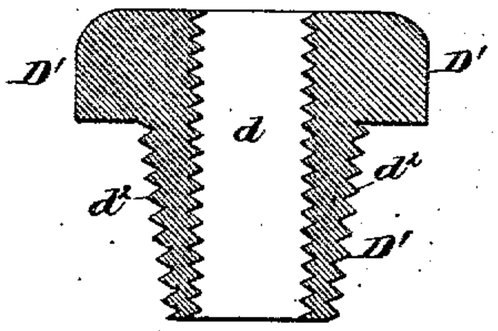



Fig: 1.

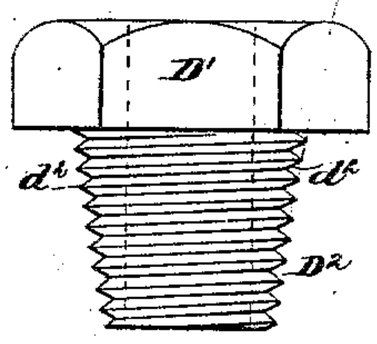



Fig: 7.

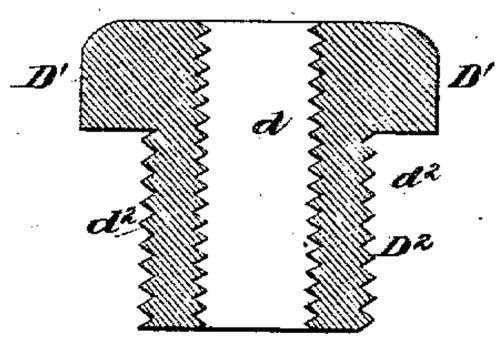



Fig: 2.

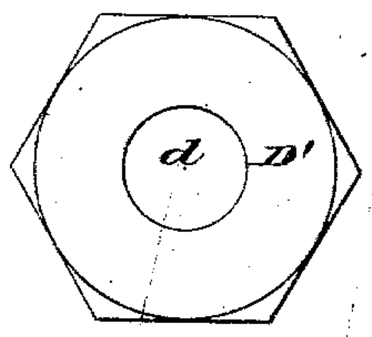



Fig: 4a.

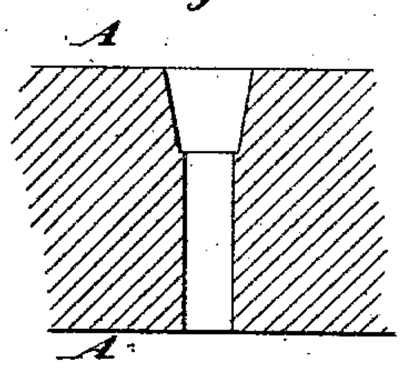



Fig: 4.

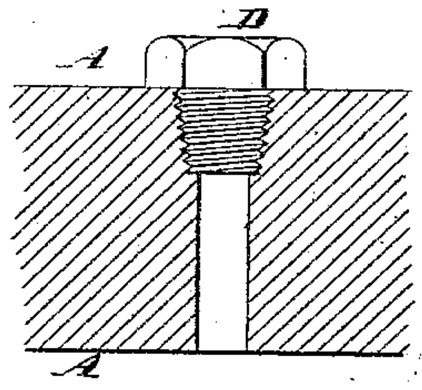



Fig: 5.

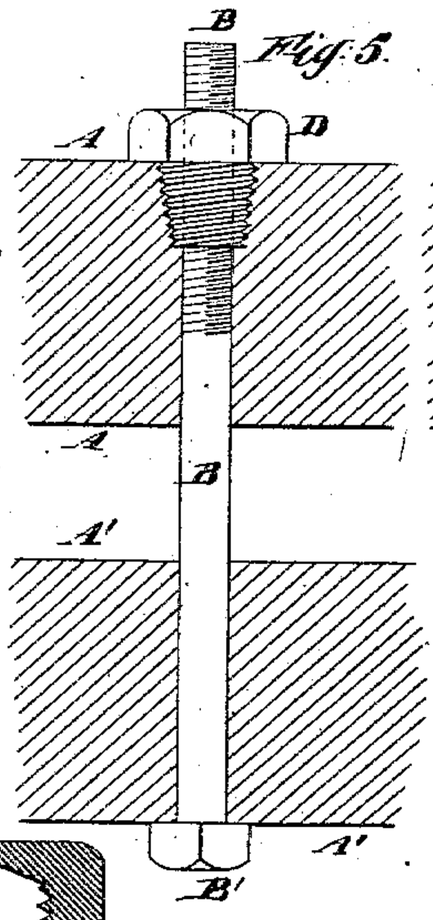



Fig: 6.

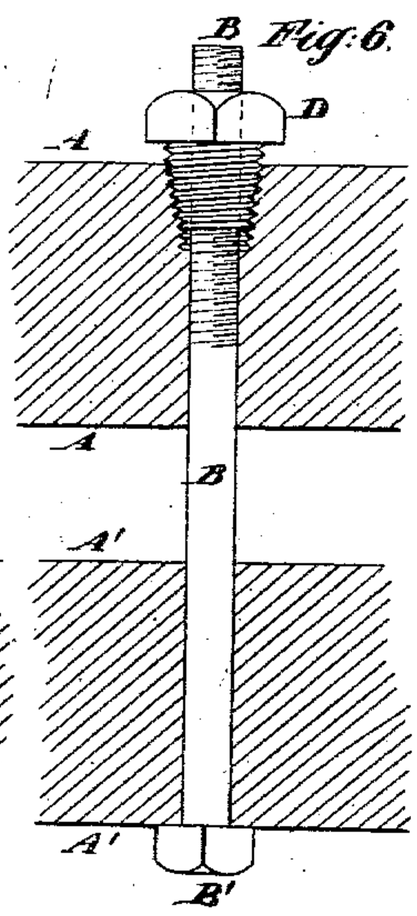
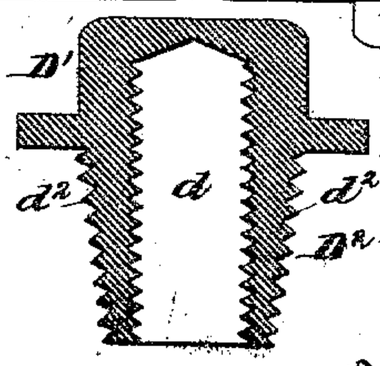



Fig: 8.




Witnesses:
Charles R. Searle.
J. C. Rennee.

Inventor:
Frank G. Stark
by his attorneys
Thomas Drew Stetson.

# UNITED STATES PATENT OFFICE.

FRANK G. STARK, OF NEW YORK, N. Y.

## NUT.

SPECIFICATION forming part of Letters Patent No. 327,612, dated October 6, 1885.

Application filed October 23, 1884. Serial No. 146,255. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK G. STARK, of the city and county of New York, in the State of New York, have invented certain new and useful Improvements in Nuts, of which the following is a specification.

My improved nut has an annular projection on one face, constituting a rim encircling the threaded hole. The hole is screw-threaded, as usual, to match the bolt. The exterior of the annular rim is also screw-threaded. In what I esteem the most complete form of the invention the exterior thread varies a little in pitch from the interior thread.

My improved nut may be made of iron or other ordinary material. It may apply against wood in the manufacture of buildings, bridges, ship, and steamboat framing, and the like. It may apply against cast-iron or any other material. The hole should be previously bored to facilitate the reception of the projection. Under ordinary conditions, when the nut is in use, it has a plane face of considerable area which presses against a corresponding plane surface of the wood or metal, or against a washer or loose collar which is interposed. Its threaded projection also matches into the cavity, which is an enlargement of the ordinary hole which receives the bolt in cast-iron or other metal, or in hard wood. The cavity should be threaded by a tap or other suitable device before the nut is inserted. In soft wood, as pine or spruce, the hole may be left plain, and on bringing the nut into position and turning it forcibly the screw-threaded exterior of its rim will produce a sufficient thread in the cavity.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a side view, Fig. 2 an end view, and Fig. 3 a central longitudinal section, of my nut. Figs. 4, 5, and 6 represent the nut in use. They are longitudinal sections. Fig. 4 shows the nut firmly inserted in the material which it is to aid in confining. Fig. 4ª shows the hole previous to the insertion of the nut. Fig. 5 shows the bolt in place. In this condition the nut is performing its usual principal function, that of strongly engaging with the bolt. Fig. 6 shows the nut partly unscrewed. This represents the condition when the nut is used for delicate adjustment of the tension on the bolt. Fig. 7 is a longitudinal section through a form of the nut more especially adapted for use in iron machinery. Fig. 8 shows another modification.

Similar letters of reference indicate corresponding parts in all the figures.

I will describe my nut and its connected bolt as applied to hold together certain parts of a bridge-framing or analogous stout structure of wood.

A A′, &c., are timbers which it is desired to hold.

B is a screw-bolt. B′ is a head for such bolt. The other end of the bolt is screw-threaded and adapted to engage with my nut, or with any other ordinary nut.

D is my improved nut, certain portions being designated, when necessary, by additional marks, as D′ $D^2$. The body of the nut is marked D′. $D^2$ is a threaded projection surrounding the threaded hole *d*. If the nut is intended for use with an iron frame, the exterior of the projection $D^2$ may be nearly cylindrical. If the nut is to be used with soft wood, it may be tapered to the extent shown, or something more or less. For either situation the exterior of the projection $D^2$ is screw-threaded.

In what I esteem the generally preferable construction the male screw-threads $d^2$ on the exterior of the projection $D^2$ are of a little greater pitch than the female screw-threads in the interior of the bolt-hole *d*. A cavity to receive the projection being previously bored, the nut is first applied so that its screw-threads $d^2$ engage in the cavity in the wood, and screwed home. As the threaded projection $D^2$ sinks into the slightly smaller recess in the wood it produces clearly-defined threads in the wood corresponding to the threads in the screw. The parts should be so proportioned that as the bottom face of the rectangular portion D′ bears on the upper face of the part A the projection $D^2$ is embraced very tightly in the material of A. The bolt B B′ is then in-

serted from below, and turned by a wrench or other suitable device to engage tightly with the screw-threads of my nut. The friction induced by the tight grip of the material on the projection $D^2$ prevents the nut from ever working loose under any circumstances.

For use on metal, as in holding together the cast-iron parts of a large printing-press or other machine, the recess to receive the projection $D^2$ is bored or otherwise produced cylindrically, and screw-threads are impressed by hand or by machinery having a corresponding cylindrical character. In other words, the screw does not taper.

When the nut is made for use in wood-work, or when in any material where it is to cut its own thread, I prefer it should taper. The amount of taper may be varied.

The form of this nut involves peculiar effects in the working which are of marked advantage. The depth of the available portion of the nut to hold on the bolt is increased by the presence of the projection $D^2$. The friction of the nut on wood or other material, A, is much greater than the friction of an ordinary nut of corresponding size. The hole to receive the projection $D^2$ should be bored out only to a sufficient size to allow the projection $D^2$ to be properly entered. There should be a tight grip of the wood on the screw-threads $d^2$. The friction thus generated prevents the nut from shaking loose. Bolts having my nuts properly applied will endure any amount of ordinary or extraordinary jarring without becoming loose.

I attach importance to the fact that the projection $D^2$ is continuous, or not split. Nuts have been before made for special purposes with a split conical projection adapted to be compressed tightly together upon the bolt by acting forcibly on the exterior with an inclosing-nut. My nut is radically different, not only in the mode of using and in the absence of the inclosing-nut, but in the fact that the projection is, by reason of its undivided condition, able to withstand any amount of compressing force without being sprung inward.

Modifications may be made in the forms and proportions without departing from the principle or sacrificing the advantages of the invention. Parts may be used without the whole.

By producing the screw-threads $d^2$ on the exterior of the projection $D^2$ of exactly the same pitch as the threads in the bolt-hole $d$ I produce a nut having the same general appearance, and which may be used in the same manner as above described. It will have the same effect, so far as strongly holding the bolt is concerned, providing the direction is followed that the nut be first firmly inserted quite down to its bearing and that the bolt be afterward screwed into it from within; but it will then fail to possess any facility for adjusting the tension. Such a nut may, as will be obvious on reflection, be unscrewed to a considerable extent without changing the tension on the bolt. It can always be screwed down, so as to bring the square portion D′ to a fair bearing on the outer face of the wood. On the other hand, instead of making only a slight difference in the pitch between the exterior threads, $d^2$, and the interior threads of the nut, I can give a great difference to the pitch, or even can make the exterior threads left-handed, while the interior threads are right-handed. This latter gives a very rapid change of tension on the bolt as the nut is adjusted outward or inward. An objection to this lies in the fact that it is not practicable always to obtain with such nut a fair bearing of the main body of the nut against the wood.

It will be readily understood that my nut may be backed by another nut, serving therewith as a jam-nut, in cases where extraordinary precautions against loosening are required; but I do not propose, generally, to use such. The friction produced by the embracing of my nut by the surrounding material renders a jam-nut unnecessary. It is a chief merit of my invention that it will hold firmly without a jam-nut, and without any mutilation or distortion of any part.

I can make my nut with a closed end, or what is sometimes known as a "box end." Such may be useful on the axle of carriages and in other situations.

Fig. 8 shows a form in which this feature is embodied. This nut is also formed with a flange, which, when the nut is in use, presents the appearance of a washer under an ordinary nut.

I claim as my invention—

1. The nut described, having the undivided projection $D^2$ in the acting face adapted to generate friction in the material against which it acts without allowing itself to be compressed, all substantially as herein specified.

2. A nut having a projection, $D^2$, and provided with a screw-thread, $d^2$, on the exterior of a different pitch from the interior threads, in combination with the bolt B B′, and timbers or other articles or material, A′ $A^2$, to be confined, arranged for joint operation as herein specified.

In testimony whereof I have hereunto set my hand, at New York city, this 15th day of October, 1884, in the presence of two subscribing witnesses.

FRANK G. STARK.

Witnesses:
J. E. RENWEE,
CHARLES R. SEARLE.