

(Model.)

S. M. GUSS.

NUT LOCK.

No. 316,616.

Patented Apr. 28, 1885.

Fig. 1.

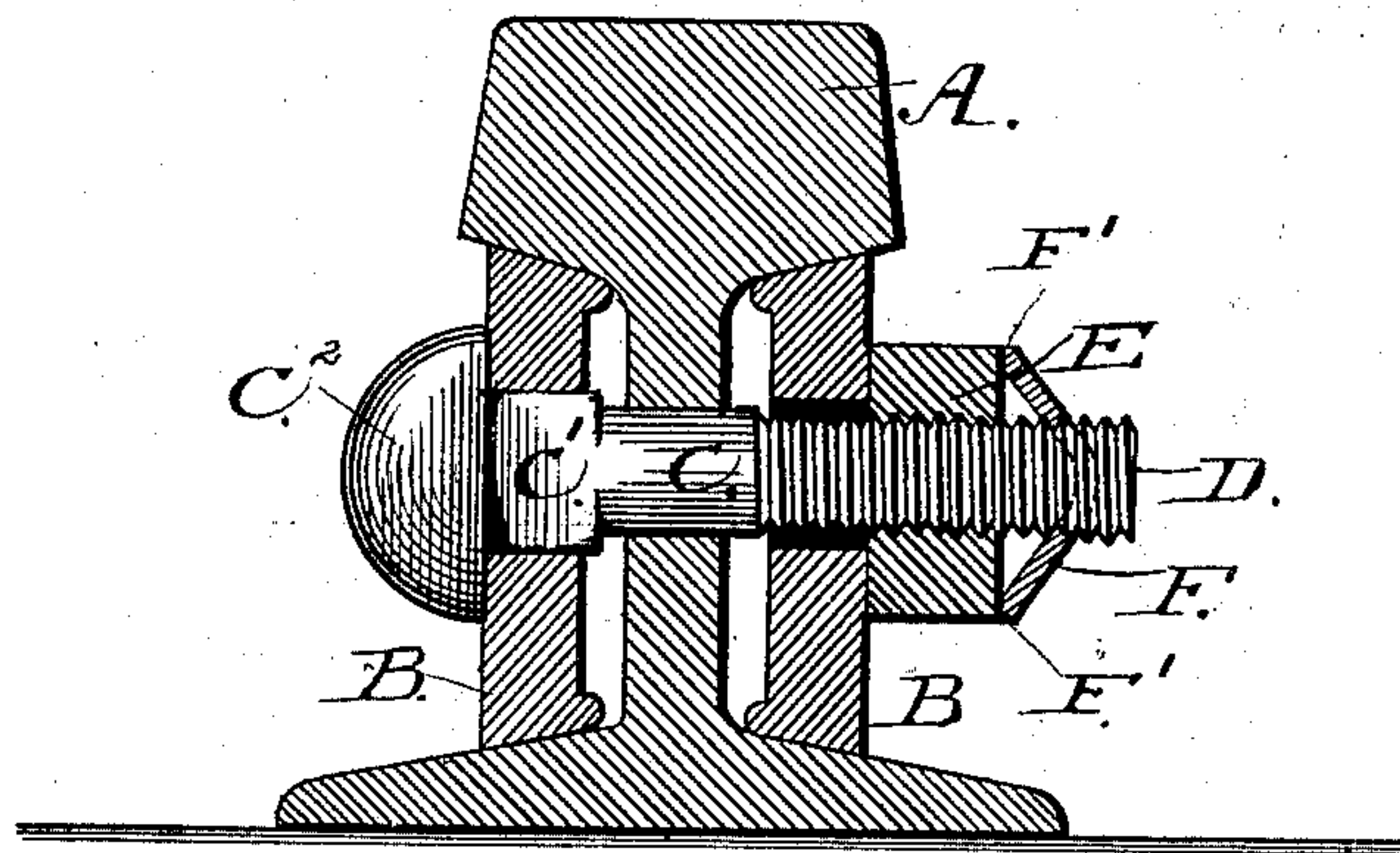


Fig. 2.

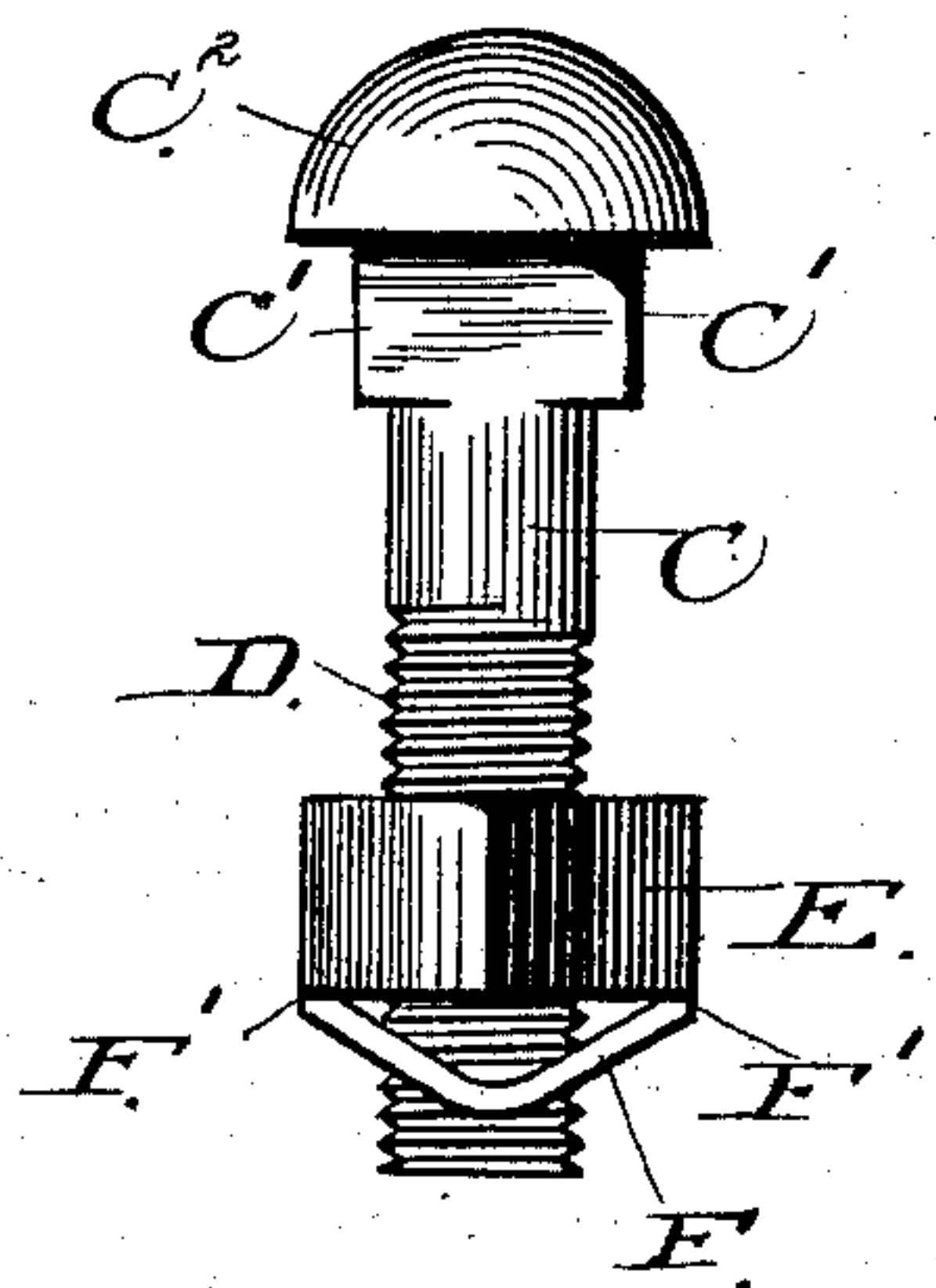


Fig. 3.

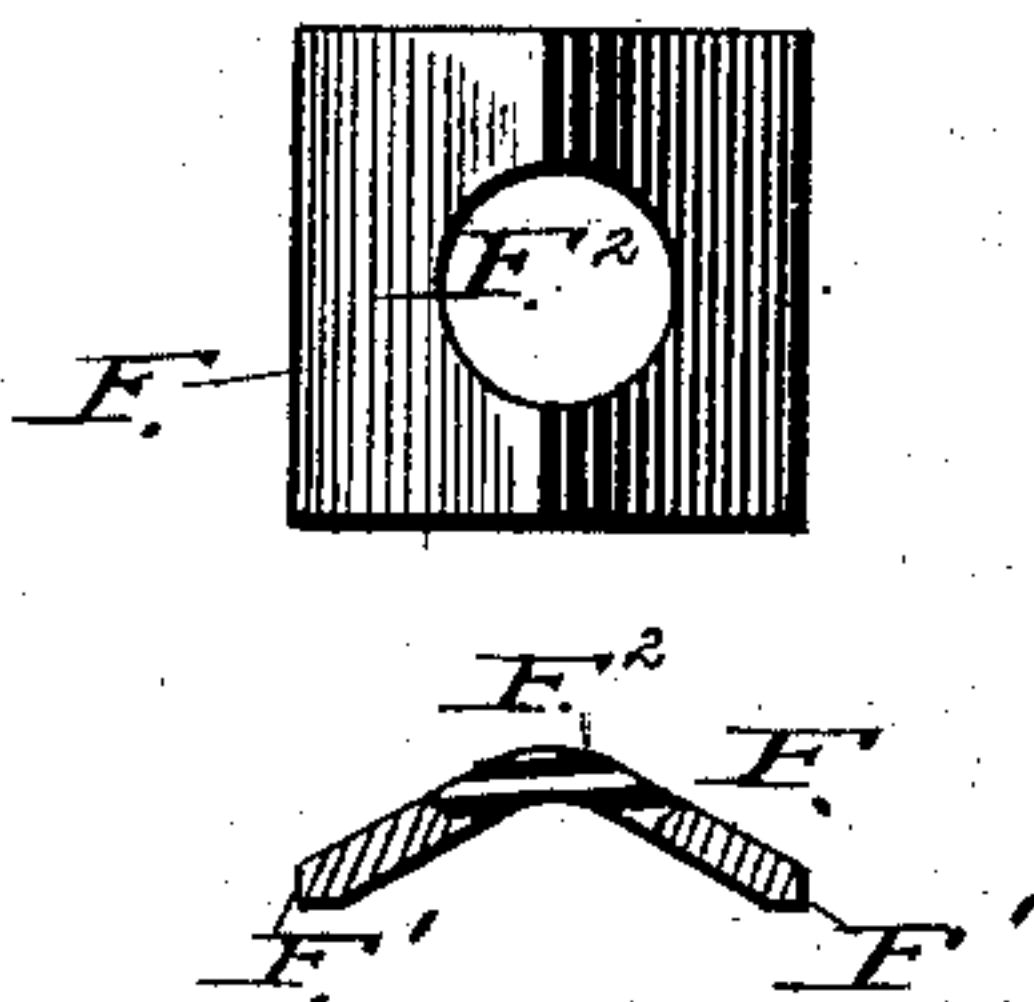
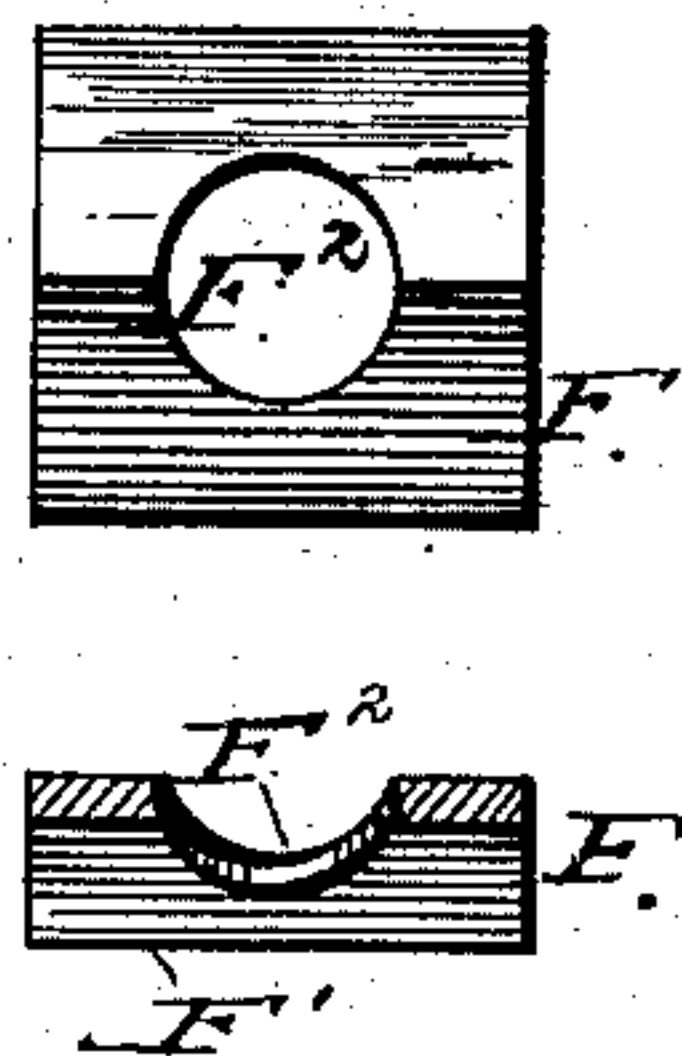


Fig. 4.



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UNITED STATES PATENT OFFICE.

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NUT-LOCK.

SPECIFICATION forming part of Letters Patent No. 316,616, dated April 28, 1885.

Application filed December 20, 1884. (Model.)

To all whom it may concern:

Be it known that I, SAMUEL M. GUSS, a citizen of the United States, residing at the city of Reading, county of Berks, State of Pennsylvania, have invented a new and useful Improvement in Nut-Locks, of which the following is a specification.

This invention relates more particularly to nut-locks for railroad-bar fish-plates, but is well adapted to be used at any point or for any service where it is desirable to secure nuts in place.

The object of the invention is to furnish a sure and reliable lock for nuts, and to obtain the same in a simple and inexpensive manner, to do away with jam-nuts and the expense attendant upon their use, and yet retain all the advantages of the same—to wit, the repeated use of the same nuts.

The lock consists, essentially, of washers of suitable form cut from a bar of steel rolled of an angular cross-sectional form, and of a width corresponding with the short diameter of the nut, the thickness being adapted to the size of bolt for which the lock is desired. Flat bars or sheets of iron or steel may be used, and the locks, being punched from the same, are subsequently bent in one direction into the angular form. I give preference to the former mode of construction. The holes for the thread may be punched or drilled, as found most convenient. I prefer to have the lock-washers of the same size as the nut, on plan, and to have a slight level bearing on the lower edges of the angular sides, where they rest upon or contact with the nut.

To enable others skilled in the art to construct and apply my invention, I will describe it more fully, referring to the accompanying drawings, in which similar letters indicate similar parts.

Figure 1 is a cross-section of a rail-joint through the bolt, showing the nut-lock thereon. Fig. 2 shows the bolt, nut, and lock-washer. Fig. 3 is a plan and cross-section of the lock-washer through the short diameter of the same. Fig. 4 represents a plan and a cross-section of the lock-washer, taken at right angles with that of Fig. 3.

A represents the rail; B, the fish-plates; C,

the body of the bolt; C', enlargement to prevent turning; C², head; D, threaded portion; E, nut; F, lock-washer, of an angular cross-section; F', flat bearing on edge of washer; F², a partially-threaded hole in the apex of the washer.

The rail A and fish-plates B may be of any desired construction, and, as shown, illustrate any parts that may be connected by bolts and nuts. The bolt C is of the ordinary fish-plate form, and is held from turning by an oblong enlargement near the head, fitting into a like hole in the fish-plate, or by other suitable means. The nut E is the ordinary square or hexagonal form, adapted to screw upon the bolt.

I prefer, for the purpose of securing greater elasticity and for the same weight of washer greater strength, to first roll the bars in suitable lengths and of the desired width, thickness, and angle, of steel, using the crop ends of steel rails for that purpose as a measure of economy.

The bars may be subsequently punched and cut to the desired size by a single operation; or the bars may be first punched or drilled, and subsequently cut to lengths, or vice versa.

The thickness of the lock-washer will be in a measure regulated by the size of bolt and the pitch of thread upon the same. I find that for the ordinary three-fourths-inch fish-bolt a washer of from one-eighth-inch to three-sixteenths-inch thickness gives ample security to the lock and retains its elasticity.

The washers may be threaded separately in a suitable chuck, or they may be superimposed upon each other and clamped in that position, when the tap would pass through the pile similar to threading a nut.

The lock-washer consists of a piece of elastic metal, preferably steel, of the size and form, on plan, of the nut upon which it is to be used, its cross-section in one direction being a plain parallel surface, while the cross-section at right angles to the first will be of an angular form, as shown in the drawings. Care must be taken in tapping not to alter the normal angle of the washer, so that it shall not fail to screw upon the bolt as freely as the nut.

In use the bolt and its nut are manipulated as

though no lock was to be applied, and after the parts are securely brought together the lock-washer is run down upon the nut with the fingers. The wrench is then brought into play 5 and the washer turned upon the nut until its edges, on plan, coincide with those of the nut, and in this position it is left until it is desired to remove the parts, when the washer is reversed by screwing, which releases the nut and 10 the same may be removed.

My lock does not in any manner interfere with the proper function of a nut upon a bolt, and it may be used in combination with any style or form of nut, rough or planished, provisions having been made by a short increased 15 length of bolt projecting through the nut for the use of the same. Its locking properties consist in its being screwed up and against the nut, thereby bringing its opposite bearing-edges F' upon the same, when, by reason of 20 its elasticity, the washer is expanded in the direction of its angular cross-section, and contracts the diameter of the threaded hole in the same direction at the apex of the washer upon 25 opposite sides of the bolt. This expansion and contraction, as described, alter the relations of the thread in the washer to that of the bolt, causing the pitch of the thread in the washer to become differential thereto. Where the 30 thread is a continuous or full one in the washer this would not occur; but from the angular cross-section of the washer it is not possible to introduce full threads in a lock having the proper thickness to give elasticity thereto. The 35 threaded holes are central to the washer, on plan, and are located at the apex of the angle of the same. This angularity in its normal state is decreased as soon as the wrench is applied to force the washer in close contact 40 with the nut, and the change of form thus produced in the position of the partial threads within the washer causes the same to grip the

threads of the bolt so tightly upon opposite sides that no amount of subsequent use, strain, or vibration will automatically loosen the same 45 or release the nut.

The lock-washer, being constructed with a smooth flat bearing upon its lower angular edges, F' , thereby preventing abrasion of the nut, is adapted to be applied to engine and 50 machine work fitted up in the very best manner, and its use will not detract from the appearance of the same, while it will be more convenient to use and be more readily applied to connecting-rods, caps of bearings, &c., than 55 keys or pins, and the cost of security is cheapened thereby.

Having described my invention and shown its construction, use, and advantages, I desire to secure by Letters Patent the following claims. 60 thereon:

1. In nut-locking devices, a V-shaped cross-sectioned elastic metallic washer, the perforation for the bolt having an interrupted or broken thread therein, substantially as shown, 65 and for the purpose described.

2. In a nut-locking device, the combination, with a full-threaded bolt and nut, of an elastic V-shaped cross-sectioned washer broken-threaded in the apex of the same, substantially 70 as and for the purpose set forth.

3. In a nut-locking device, the combination, with a threaded bolt and nut, of an elastic V-shaped cross-sectioned metallic washer, provided with a flat bearing-face, F' , upon the 75 base edges of the same, whereby abrasion of the nut is prevented and the same may be repeatedly used, as described, and substantially for the purpose specified.

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