

A. H. PARTRIDGE.

NUT LOCK.

APPLICATION FILED JUNE 1, 1909.

969,397.

Patented Sept. 6, 1910.

Fig. 2

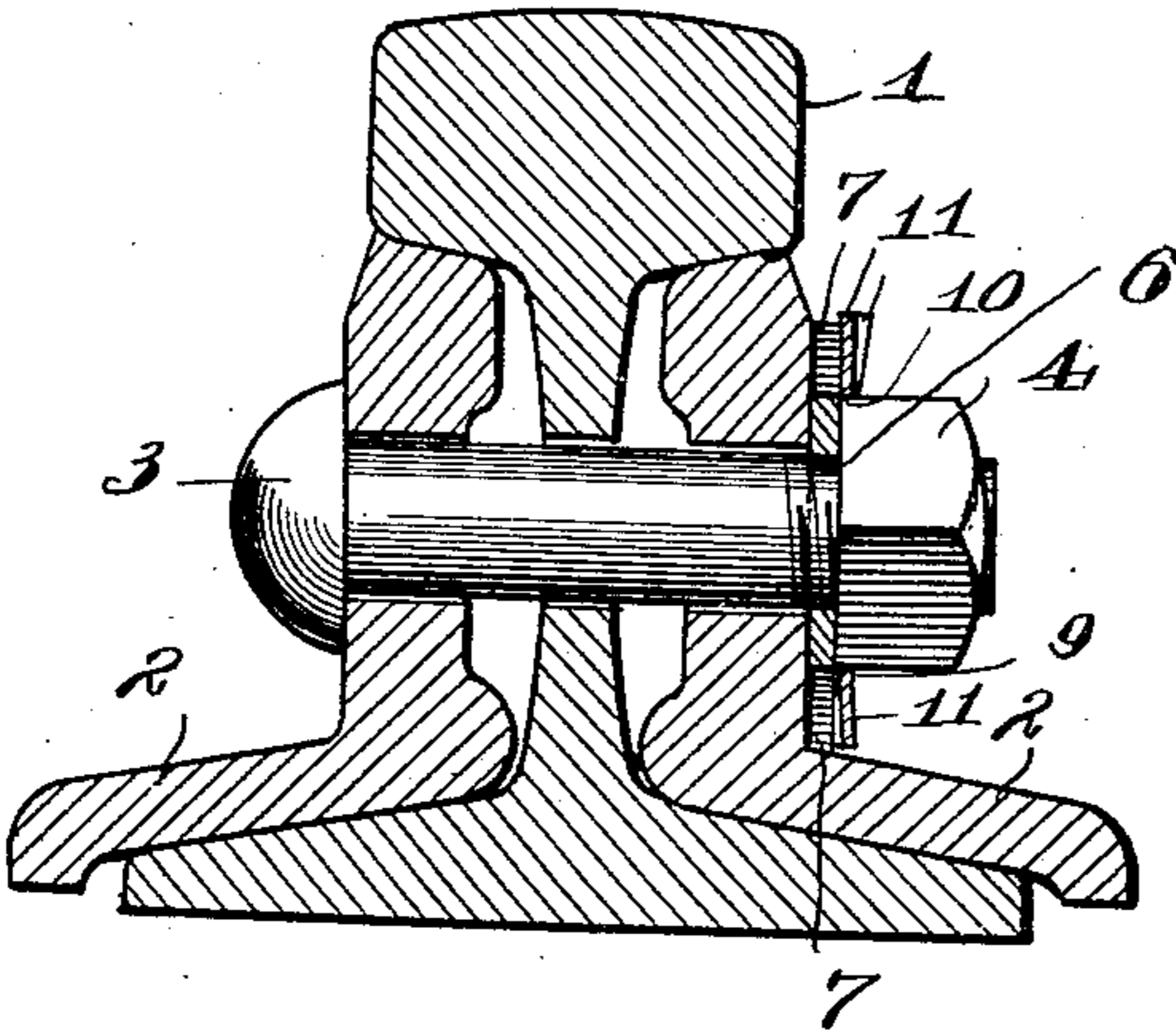


Fig. 1

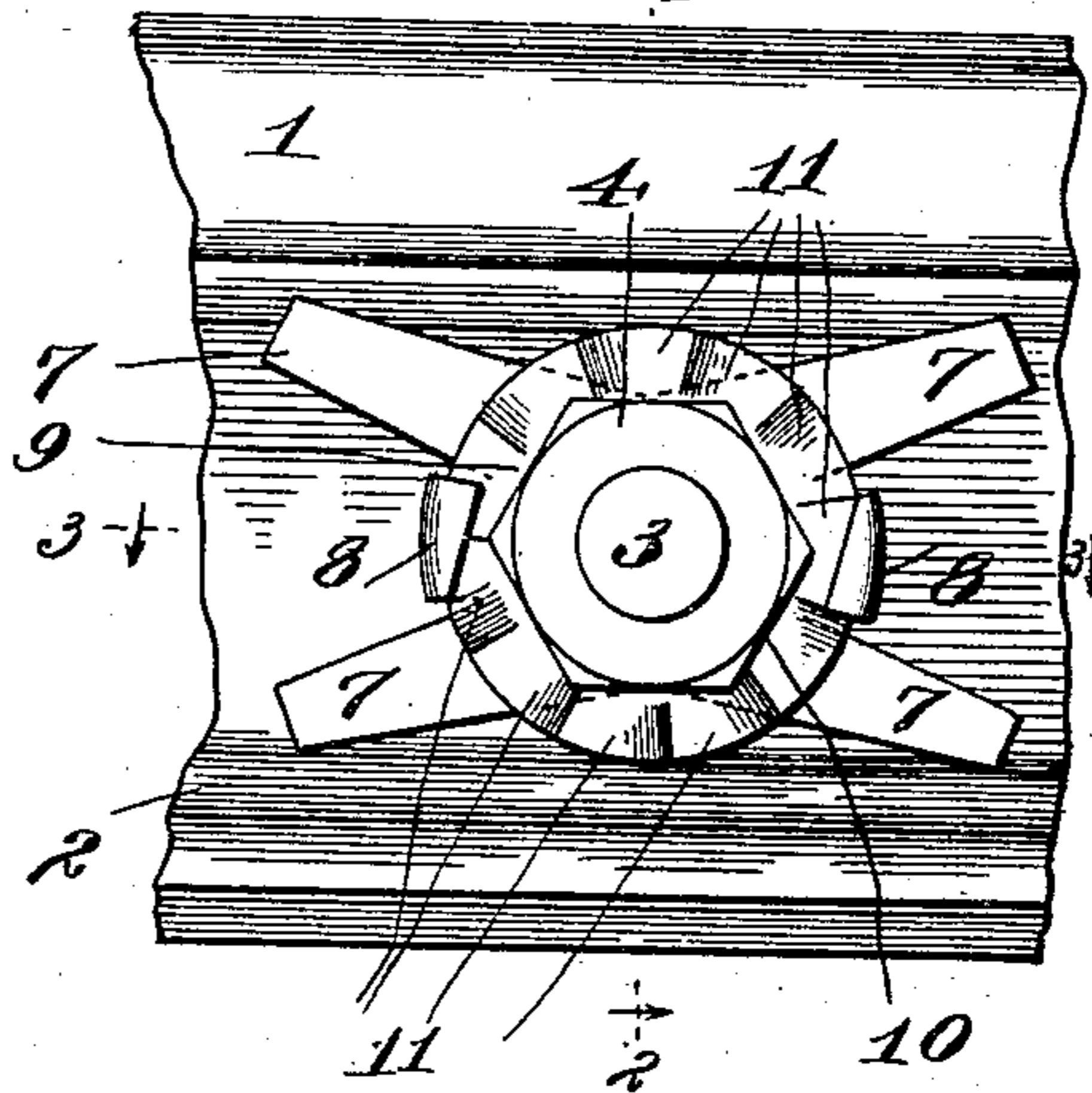


Fig. 3

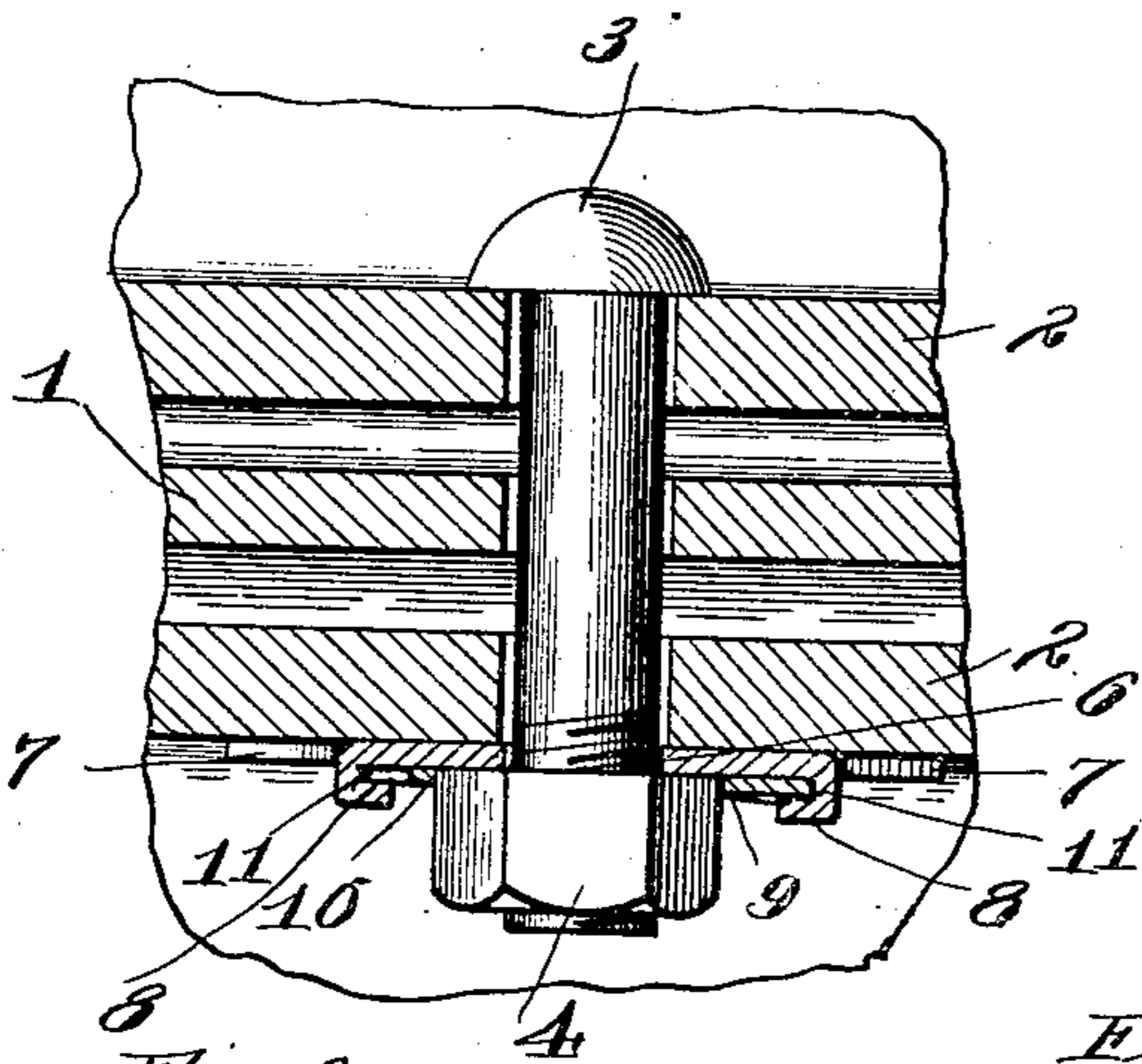


Fig. 4

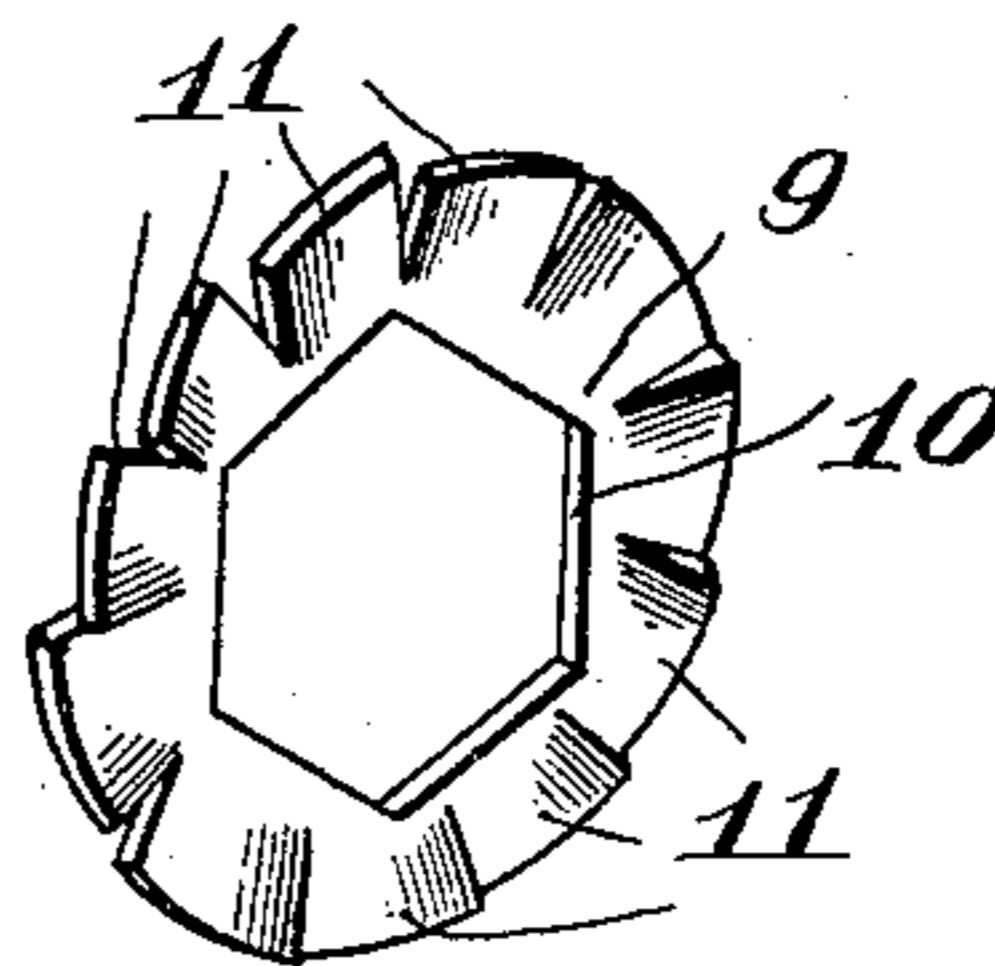


Fig. 6

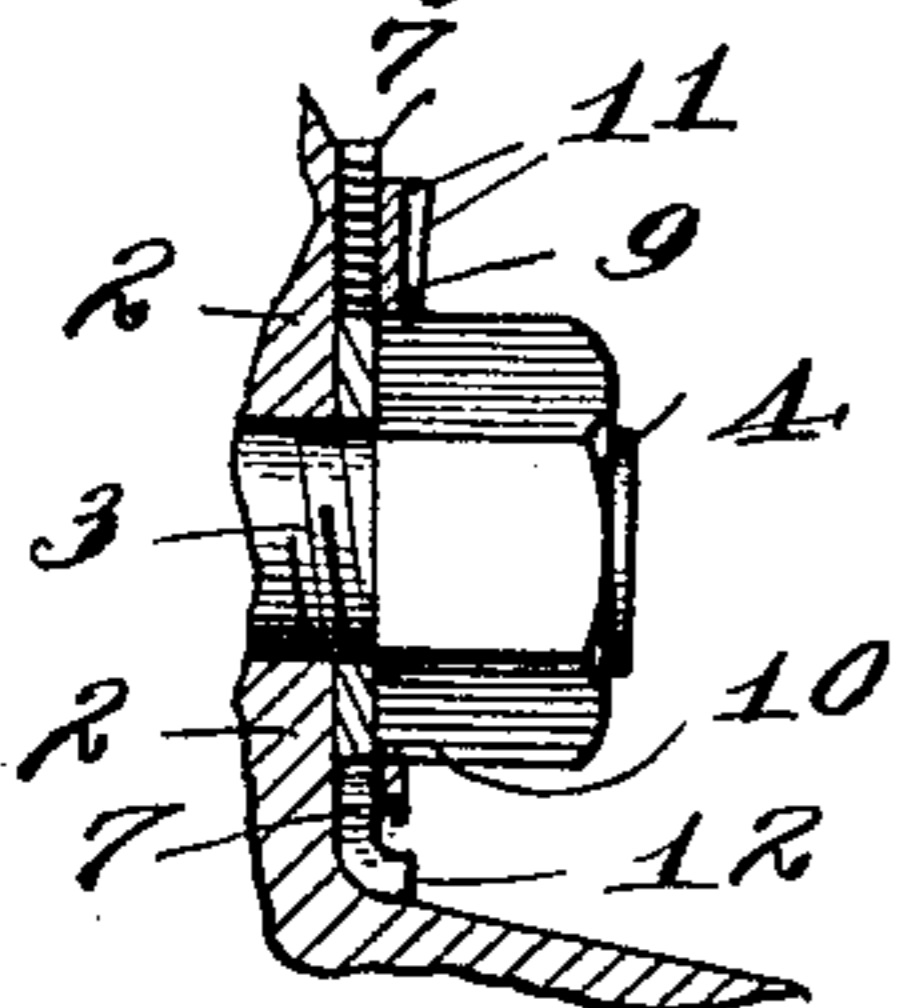


Fig. 7

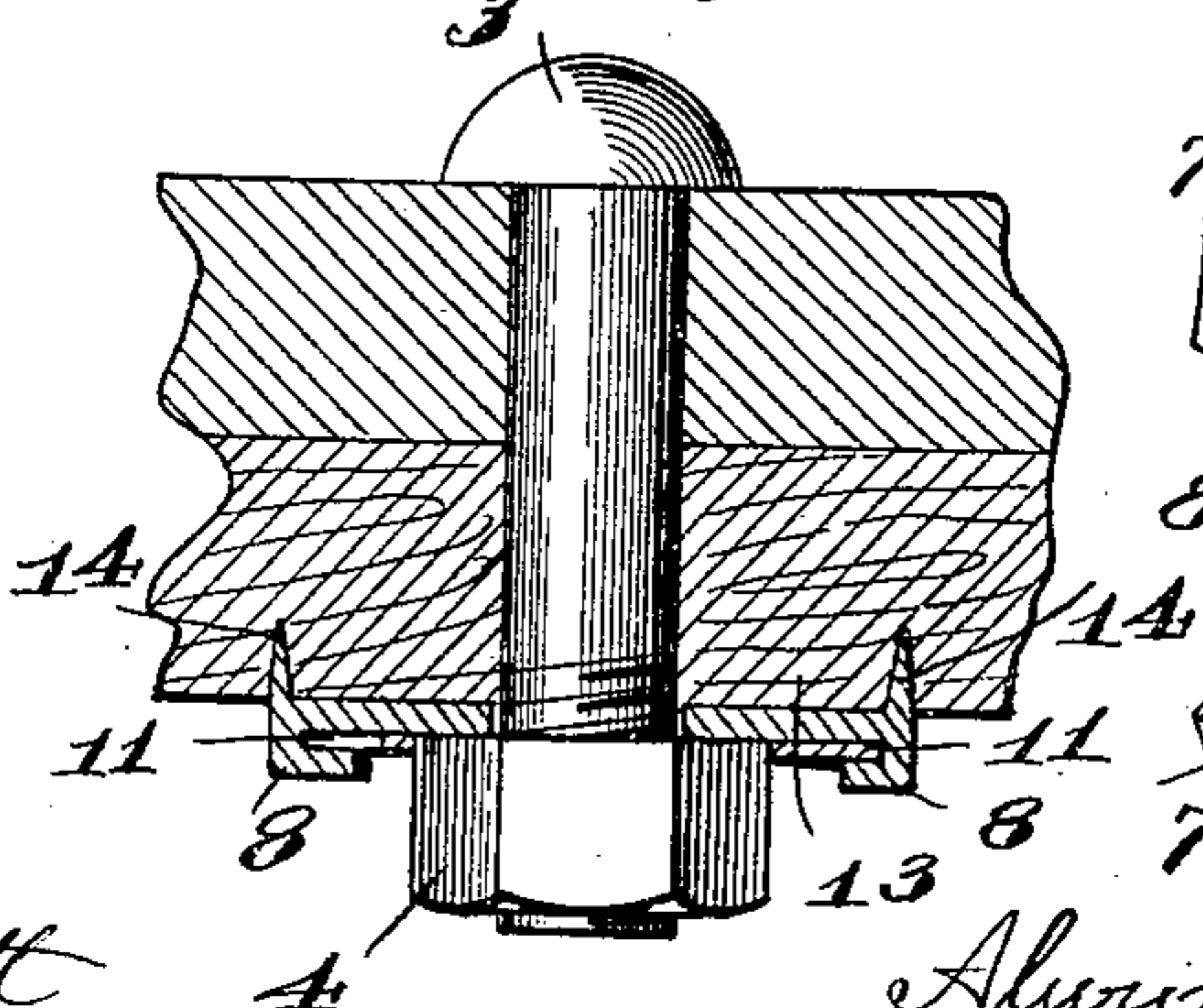
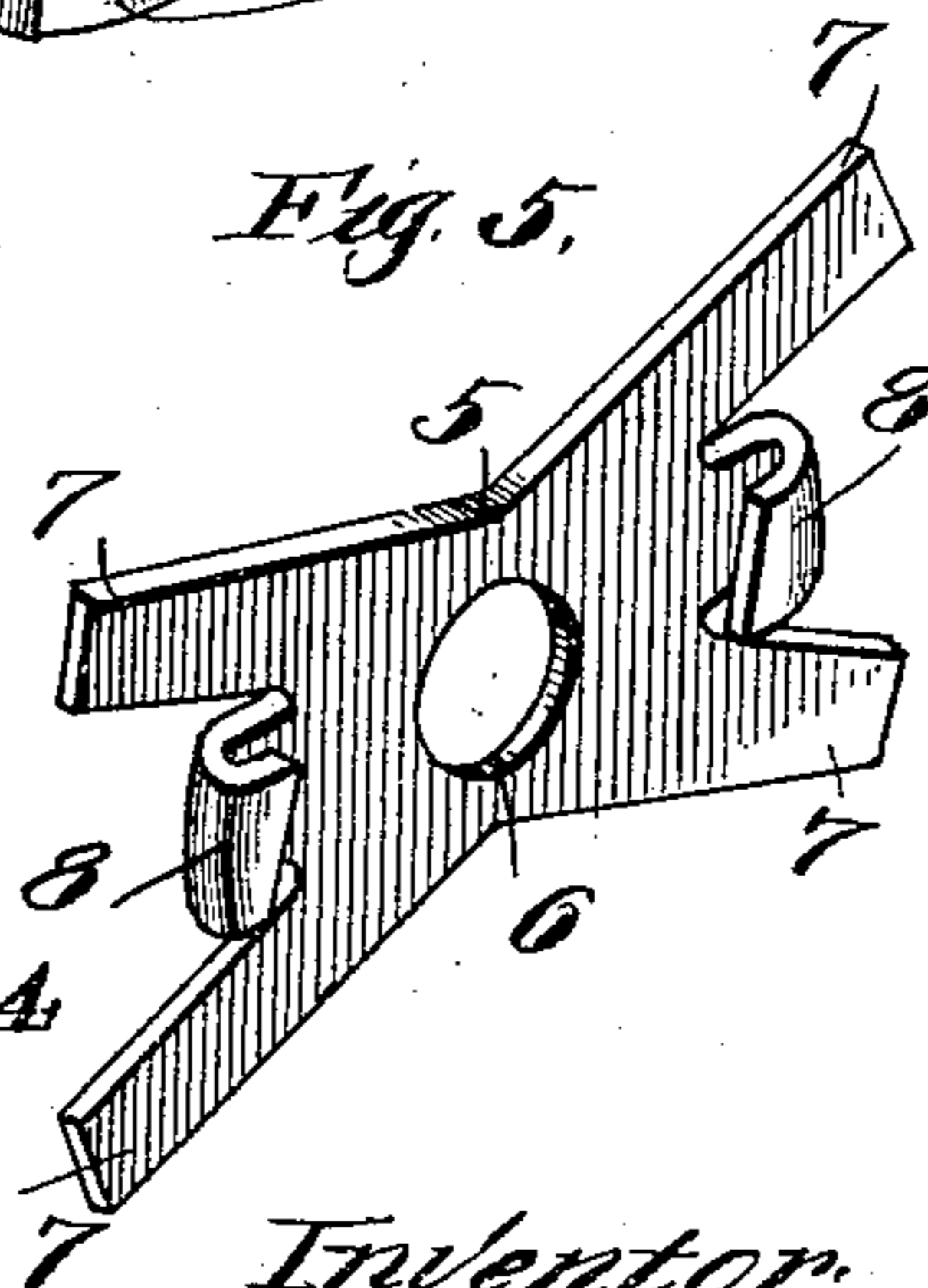


Fig. 5



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## NUT-LOCK.

969,397.

Specification of Letters Patent.

Patented Sept. 6, 1910.

Application filed June 1, 1909. Serial No. 499,446.

*To all whom it may concern:*

Be it known that I, ALWYN H. PARTRIDGE, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Nut-Locks, of which the following is a specification.

My invention relates to that class of devices commonly called nut-locks, which are designed to prevent the accidental back-turning or wearing loose in service of bolt-nuts; and it belongs more particularly to that type or class of nut-locks which are characterized by the employment of pawl-and-ratchet mechanism.

Many devices of this character have been devised, of which but a very few have ever been put into actual use, owing, as I believe, to the fact that they either require special modifications of the standard nut or bolt, or both, or otherwise involve difficult and expensive constructions which are prohibitive in point of cost.

The chief object of my invention, therefore, is to produce a thoroughly reliable and efficient nut-lock which shall involve no modification whatever of the established form of bolt and nut and which, by the use of suitable tools, can be very cheaply made and easily applied.

To this end the device of my invention comprises essentially two parts,—one consisting, in its simplest form, of a metal plate apertured to embrace the bolt between the base of the nut and the surface ordinarily engaged by the latter and having an edge portion or projection thereof bent over substantially parallel with itself to form a guide, stop-pawl and keeper for the other cooperating part, and further equipped with some suitable means to prevent its rotation; and the other cooperating part consisting of a circular metal plate having a central opening of polygonal shape corresponding in form and size to the base of the nut and adapted to embrace the latter and having its peripheral edge cut radially in such manner as to form a ratchet disk the teeth of which lie widthwise at a slight angle to the plane of the disk and, under the rotation of the latter with the nut, pass between the substantially parallel sides of the guide referred to; for which purpose either said teeth or said guide, or both, are sufficiently resilient to permit the described passage of the teeth

through the guide in one direction of movement and at the same time effect a pawl-and-ratchet relation between the guide and teeth preventing the turning of the ratchet disk in the opposite direction.

My invention, in two slightly differing forms, and in its manner of application and use, is illustrated in the accompanying drawing forming a part of this specification, in which—

Figure 1 is a side elevational view of the device as applied to a rail-joint fastening. Fig. 2 is a vertical section on the line 2—2 of Fig. 1. Fig. 3 is a horizontal section on the line 3—3 of Fig. 1. Fig. 4 is a perspective detail of the nut-carried ratchet. Fig. 5 is a perspective detail of the base or anchor-plate carrying a pair of oppositely disposed guides which serve as pawls or stops and also as keepers for the ratchet member. Fig. 6 is a fragmentary view in vertical section, showing a manner of making the anchor-plate adjustable to fish-plates of varying height. Fig. 7 is a sectional detail similar to Fig. 3, showing a modified form of anchor-plate adapted for use in connection with a wooden or like readily penetrable surface.

Referring first to Figs. 1 to 5, inclusive, 1 designates the rail, 2 the fish-plate, 3 a bolt, and 4 its nut, such as may be found in an ordinary rail-joint fastening. 5 designates as an entirety what I term an anchor-plate, consisting of a washer-like member adapted to be clamped non-rotatably between the inner face or base of the nut and the opposed surface of the fish-plate. This anchor-plate is centrally apertured, as shown at 6 (Fig. 5) to loosely fit the bolt, and has on either side of its central aperture a pair of outwardly divergent arms 7, giving it a substantially X-shape; and between each pair of such arms is a third arm that is bent inwardly or doubled over on itself, as shown at 8, to present a pair of substantially parallel side walls, and forming a combined guide, stop-pawl and keeper for the ratchet-member hereinafter described. When this anchor-plate is operatively engaged with the bolt and nut, the outer ends of the two lower arms 7 bear upon the base or flange of the fish-plate, thus securely holding the anchor-plate against rotation on the bolt.

9 (Fig. 4) designates as an entirety the

ratchet-member, which, as herein shown, consists of a comparatively thin disk of steel or other resilient metal having a polygonal central aperture 10 of a size and shape to loosely fit the edge of the nut. The periphery of the disk has a series of ratchet teeth 11 which, it will be observed, have their opposite radial edges slightly offset laterally relatively to and on opposite sides of the plane of the disk, so that the teeth lie widthwise or in the direction between their radial edges at a slight angle to the plane of the disk. These teeth may be formed by the simple operation of slitting the periphery of the disk radially by a suitable metal-shearing machine, the action of such machine itself effecting a sufficient relative offsetting of the edges of the teeth for the purposes of the invention, and hence making the production of the ratchet member a very simple and cheap matter so far as the forming and shaping of the member is concerned. When this ratchet disk is operatively engaged with the nut and anchor-plate it embraces the polygonal edge of the nut at the base of the latter, while its teeth slidably engage (in one direction of movement) the substantially parallel side walls of the members 8 of the anchor-plate.

In the easiest and simplest manner of applying the device, the anchor-plate, with the ratchet disk mounted in the guides 8 thereof, is passed over the threaded end of the bolt, and is followed by the nut. When the latter approaches the limit of its travel, the ratchet disk, by a slight outward movement, is mounted upon the edge of the nut, and thereafter rotates with the nut as the latter is turned up hard, the teeth 11 sliding through the guides or pawls 8 under lateral compression by virtue of their elasticity, the rear edge of each tooth, as it passes from between the walls of the guide, at once snapping out into opposed relation to the folded over wall of the guide, so that it forms, with the latter, a positive lock or stop against back-turning of the ratchet and consequently of the nut.

The principle of the invention is fully embodied in a device wherein the anchor-plate or equivalent member has but a single ratchet-engaging pawl or stop member; but I prefer to employ at least a pair of such members situated 180 degrees apart, since thereby the ratchet member is more securely held in a plane normal to the axis of the nut and bolt, and the correct engagement of the spring teeth with the stationary inclosing pawls is assured. Furthermore, the larger the number of pawls employed, when properly positioned relatively to the divisions between the ratchet teeth, the greater will be the number of locking positions securable in each rotation of the nut.

While the generally X-form of anchor-

plate or base is by no means essential, I prefer it for a variety of reasons. It may be applied either edge up without discrimination. When used in situations where the tread member of the rail overhangs the upper edge of the fish-plate, the two upper arms have an additional or auxiliary anchoring effect to prevent turning of the anchor-plate on the bolt. Also, in case the height of the plate is a little in excess of the height of the space it is to fit, the arms, under the pressure of the nut or a blow of a hammer, will readily bend and yield at their ends, as shown at 12 in Fig. 6, taking the form of the surface they oppose and thus holding the plate with even greater security against rotation.

Fig. 7 illustrates the application of the invention to a situation where the nut engages a wooden or other penetrable surface, such as a plank or beam 13. In this case no special form of anchor-plate is recommended, but the plate is preferably secured against rotation by spurs 14 that may be readily driven or forced into such surface by the pressure of the nut.

It will be observed that the ratchet member of my device is not interposed between the nut and the bolt head, as has heretofore frequently been proposed, and therefore sustains no pressure from the nut, but is only loosely articulated with the periphery of the latter, being confined in proper position thereon by the guides 8 which thus are keepers as well as pawl or stop-members. It is manifest that the requisite resiliency to secure the described joint action of the pawl members 8 and ratchet teeth 11 may reside wholly in either or partly in both, but the simplest and preferred construction is that described wherein the resiliency of the ratchet-teeth is relied on. It may also be noted that to secure the described mode of operation it is essential only that the rear lateral edge (with reference to the direction of movement) of each tooth be laterally offset relative to the plane of the disk, since it is such rear edge that coöperates with the stop member 8 to prevent back turning.

Without confining the invention to the exact and specific details shown, I claim:—

1. A nut-lock, comprising a ratchet-disk apertured to fit the edge of the nut and having a series of peripheral teeth inclined widthwise relatively to the plane of the disk, in combination with an anchor-plate apertured to embrace the bolt and adapted to be clamped by the nut, said anchor-plate having a pawl member embracing and permitting the travel of the ratchet teeth there-through in one direction of rotation only, substantially as described.

2. A nut-lock, comprising a ratchet-disk apertured to fit the edge of the nut and having a series of peripheral teeth inclined

widthwise relatively to the plane of the disk, in combination with an anchor-plate apertured to embrace the bolt and adapted to be clamped by the nut, said anchor-plate being  
 5 formed with a bent over marginal portion engaging the toothed periphery of said ratchet-disk and forming both a keeper and a stop-pawl for the latter, substantially as described.

10 3. A nut-lock, comprising a spring-metal ratchet-disk apertured to fit the edge of the nut and radially sheared to form a series of peripheral teeth inclined widthwise relatively to the plane of the disk, in combination  
 15 with an anchor-plate apertured to embrace the bolt and adapted to be clamped by the nut, said anchor-plate having a pair of oppositely disposed bent-over marginal portions engaging the toothed periphery of said  
 20 ratchet-disk and forming both keepers and stop-pawls for the latter, substantially as described.

4. A nut-lock, comprising a nut-carried spring-metal ratchet-disk having peripheral  
 25 teeth inclined widthwise relatively to the plane of the disk, in combination with an anchor-plate apertured to embrace the bolt and adapted to be clamped by the nut, said anchor-plate having a marginal projection  
 30 bent over or doubled on itself so as to form a pair of substantially parallel side walls between which the teeth of the ratchet-disk pass under lateral compression as the nut is  
 35 turned up on the bolt, substantially as described.

5. A nut-lock for use on bolts engaging a flanged member, comprising an anchor-plate

apertured to engage the bolt and having a pair of arms adapted to bear at their outer  
 ends on the flange of said member on opposite  
 10 sides of the bolt and also a pair of oppositely disposed rigid pawl members, in combination with a nut-carried ratchet-disk having peripheral spring teeth adapted to pass  
 45 said pawl members in one direction of movement but to be locked by the latter against movement in the opposite direction, substantially as described.

6. A nut-lock for use on bolts engaging a flanged member, comprising a substantially  
 50 X-shaped anchor-plate centrally apertured for the passage of the bolt and having a pair of oppositely disposed U-shaped pawl members, in combination with a nut-carried ratchet-disk having peripheral spring teeth  
 55 adapted to pass through said pawl members under lateral compression in one direction of movement but to be locked by the latter against movement in the opposite direction,  
 60 substantially as described.

7. In combination, a bolt, a polygonal nut, a metal anchor-plate having oppositely disposed portions of its edges turned over to form guides and stops, said anchor-plate pivotally encircling the bolt and secured from  
 65 rotation relatively to the bolt and nut, and a disk of resilient metal having a central polygonal aperture engaging the nut and a ratcheted periphery engaging said guides and stops, substantially as described.

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Witnesses:

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