

No. 611,815.

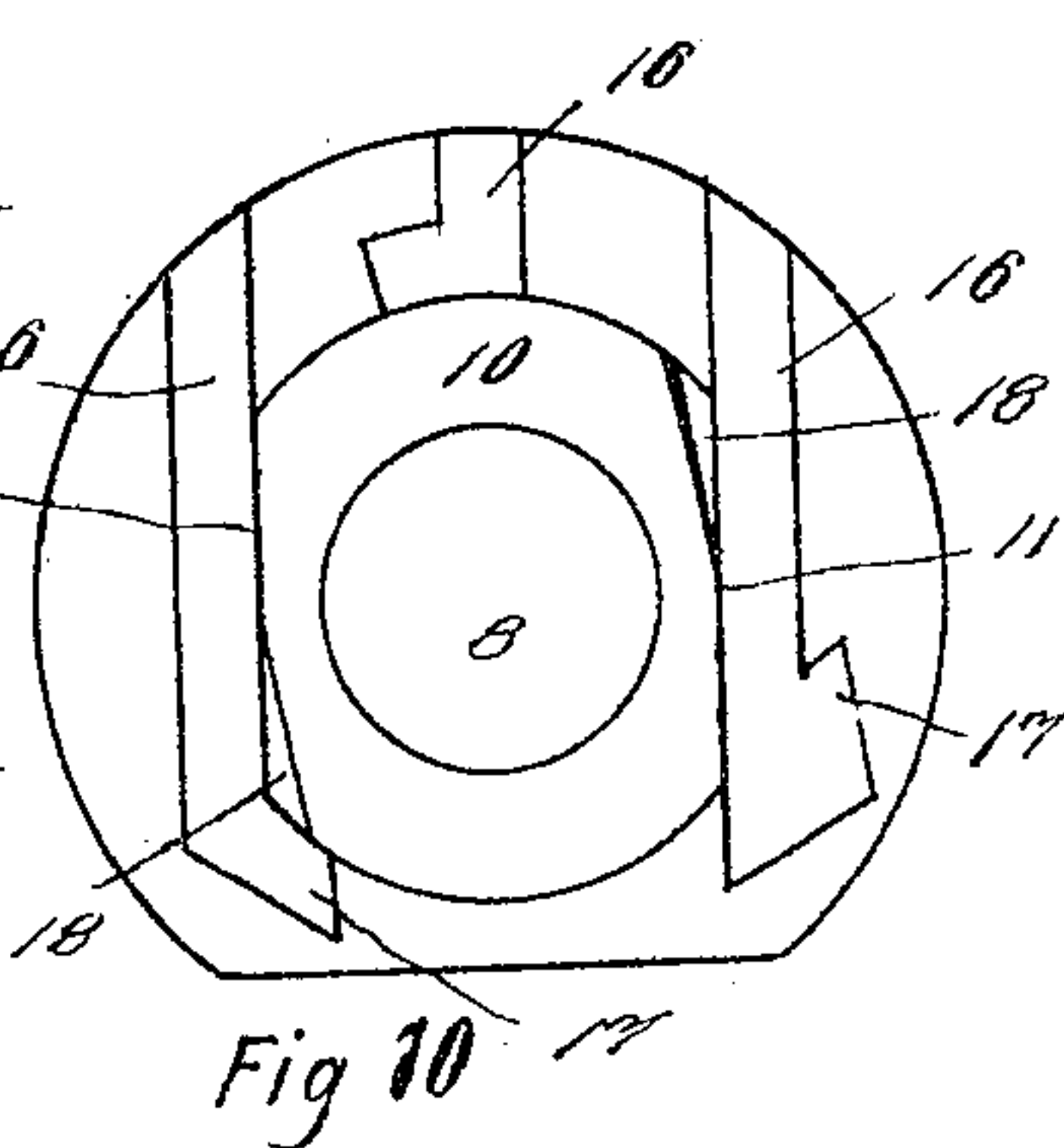
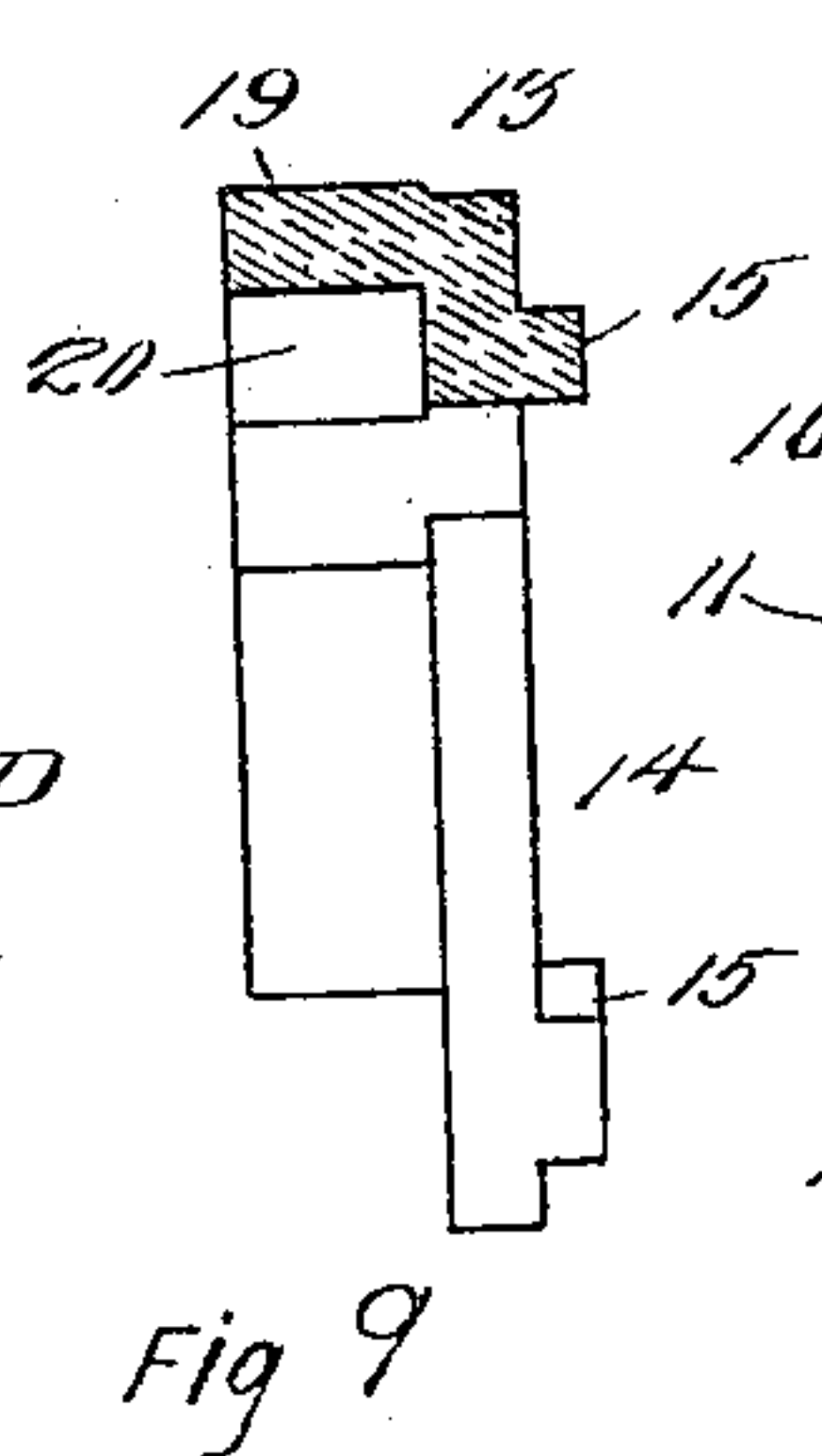
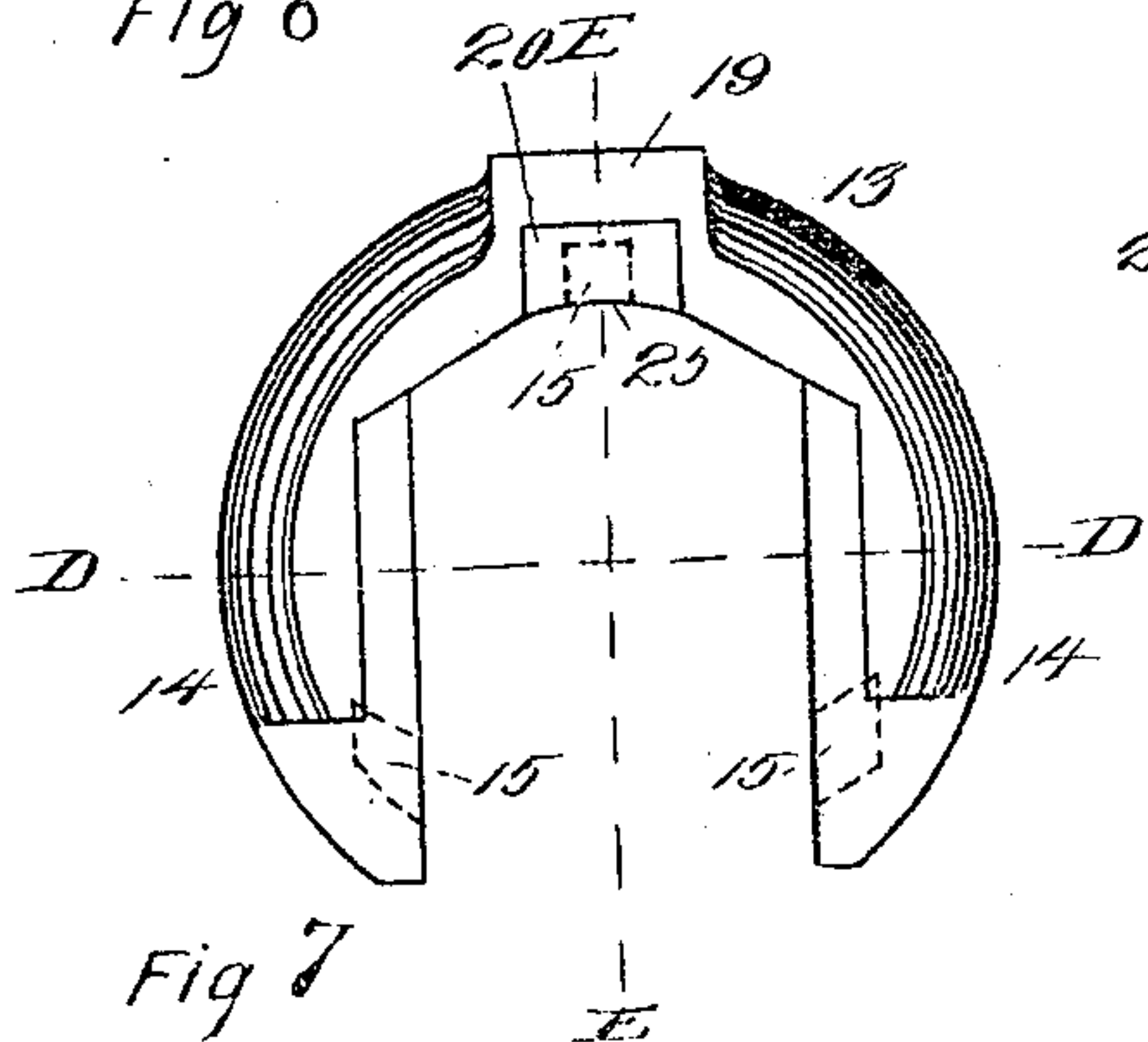
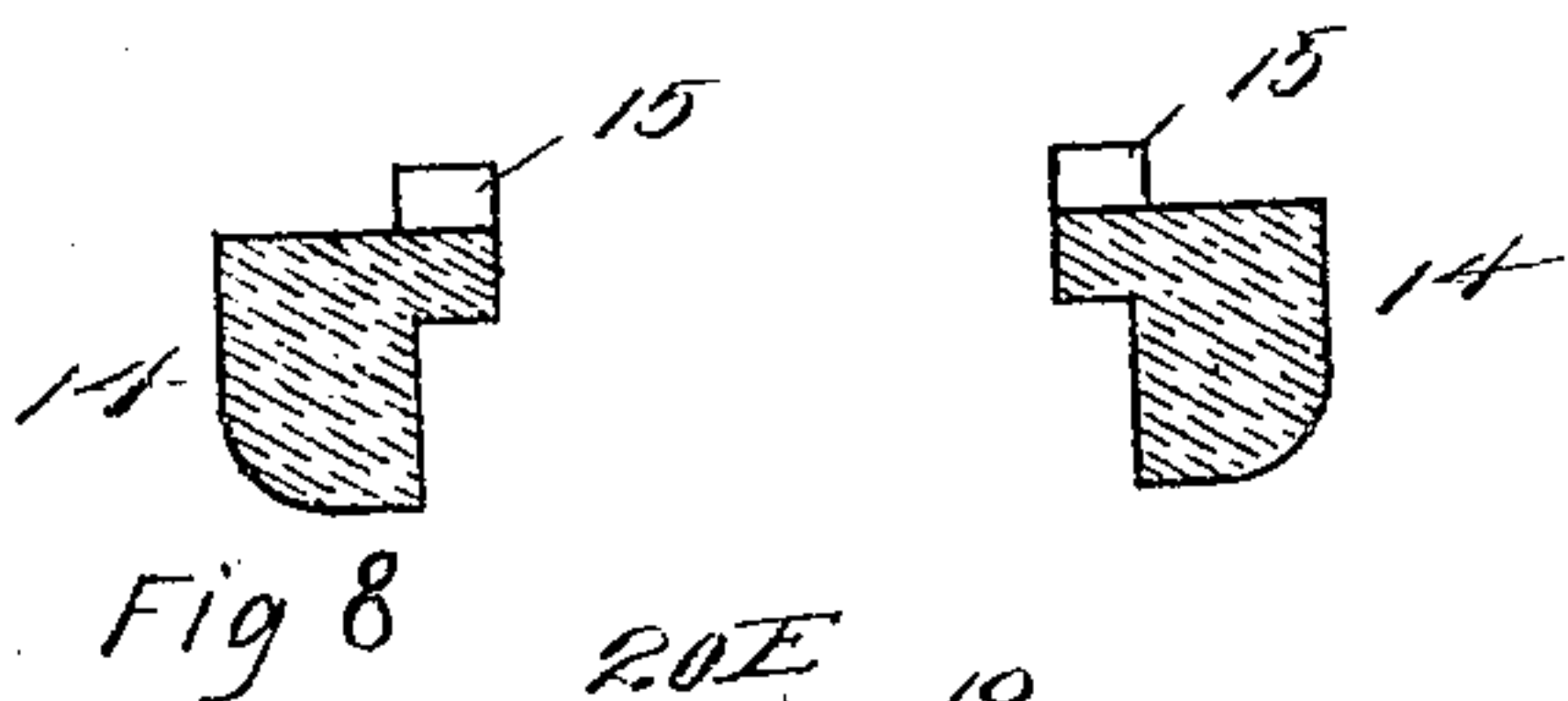
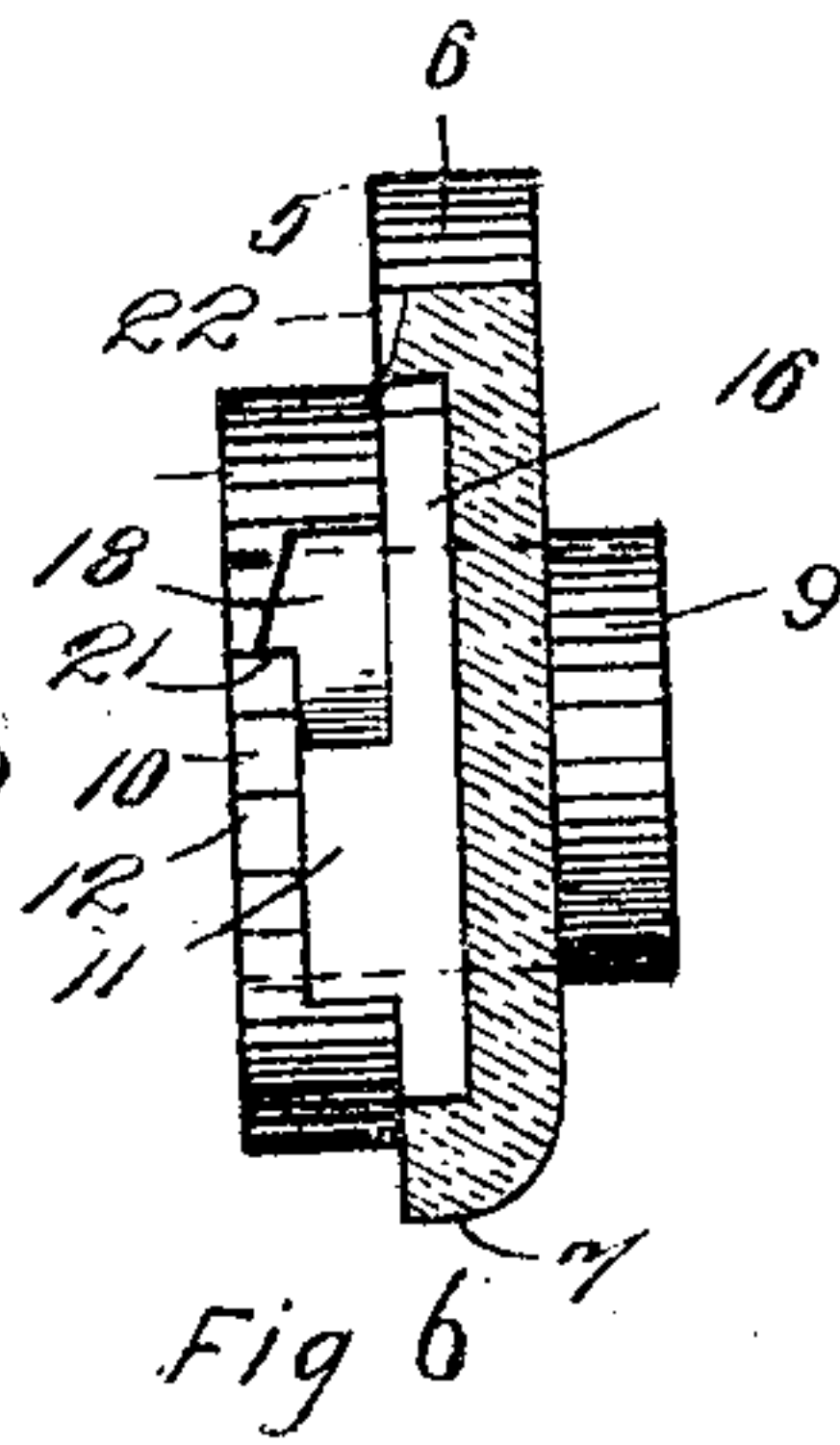
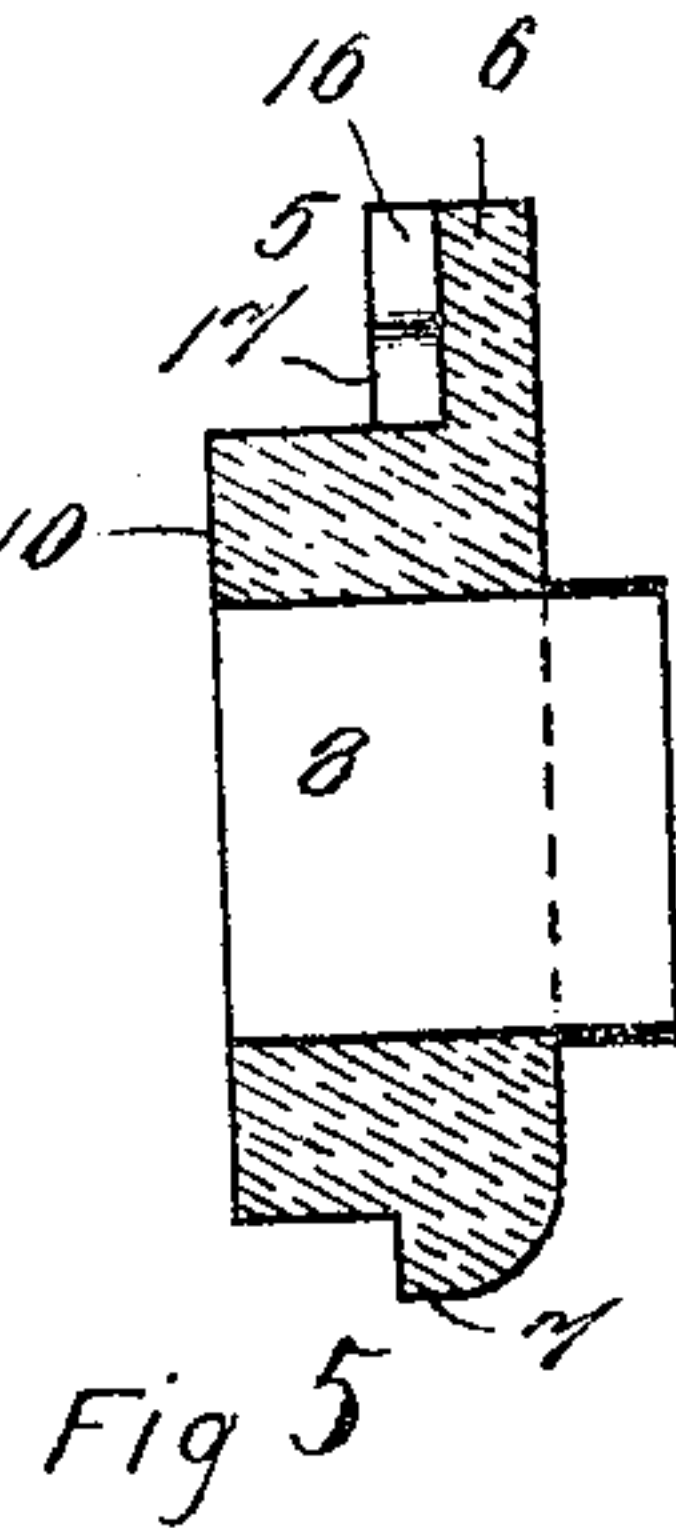
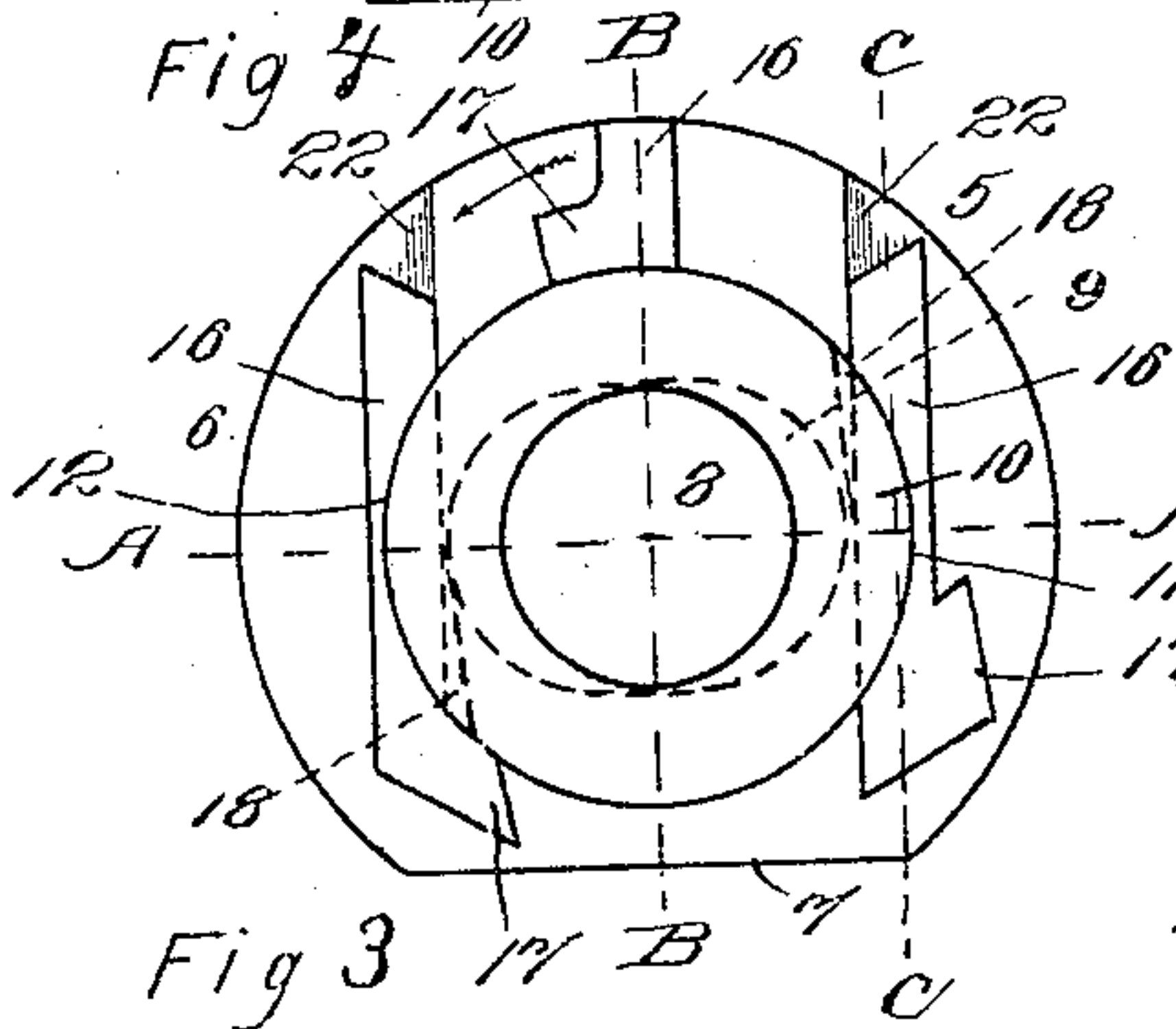
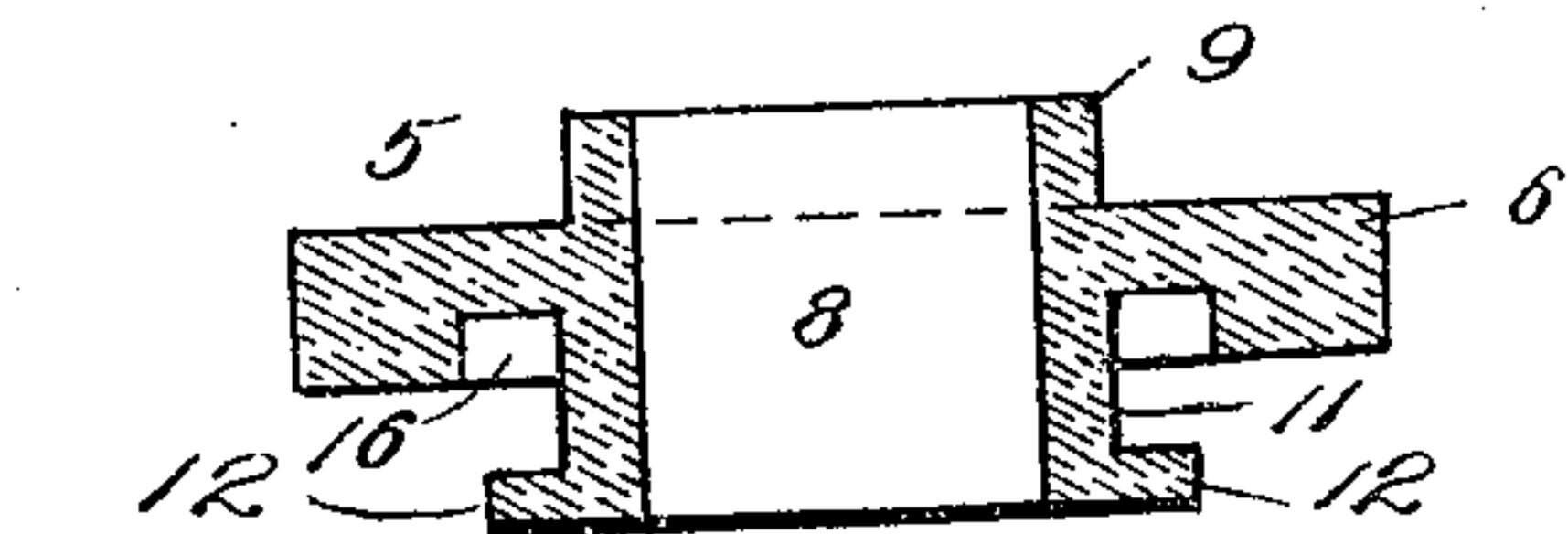
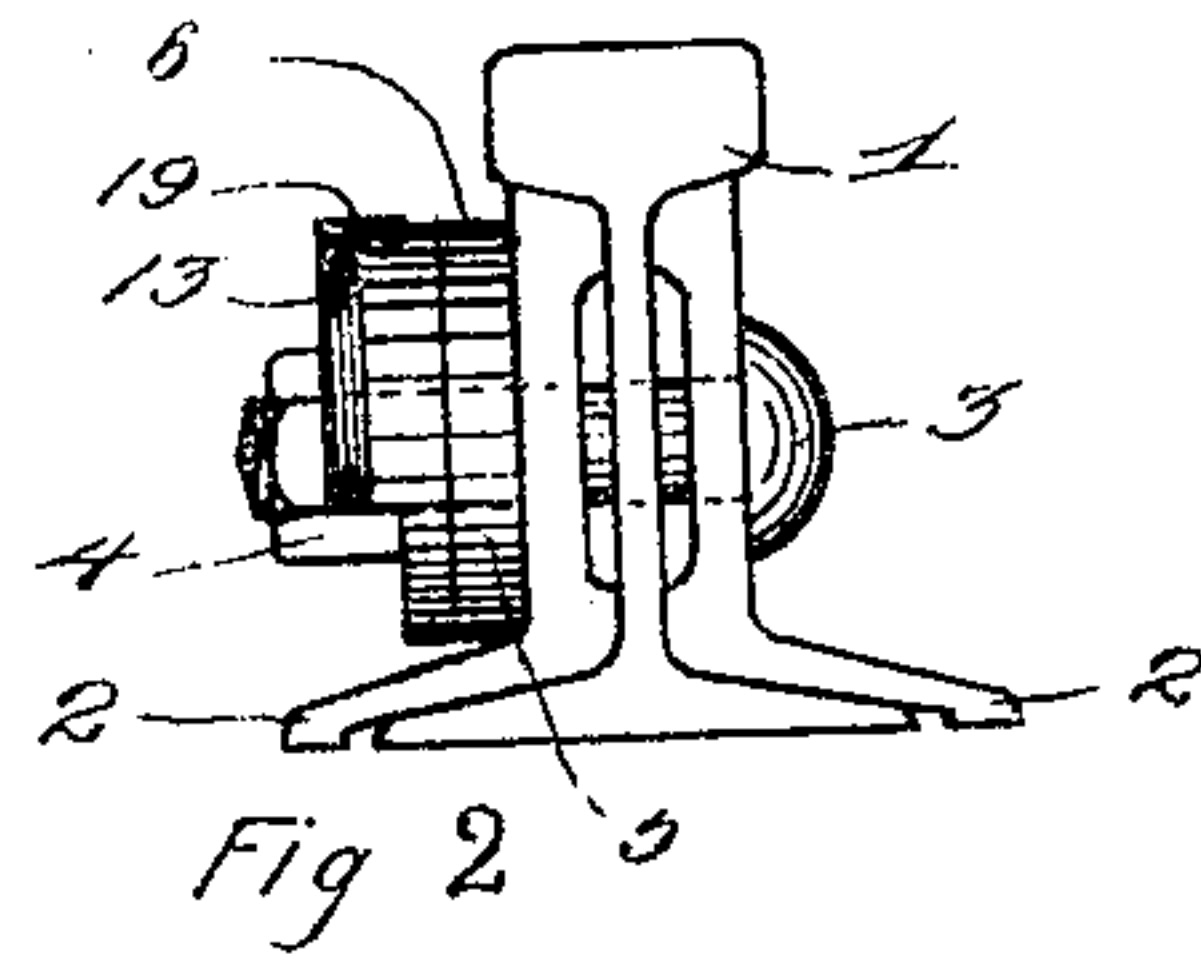
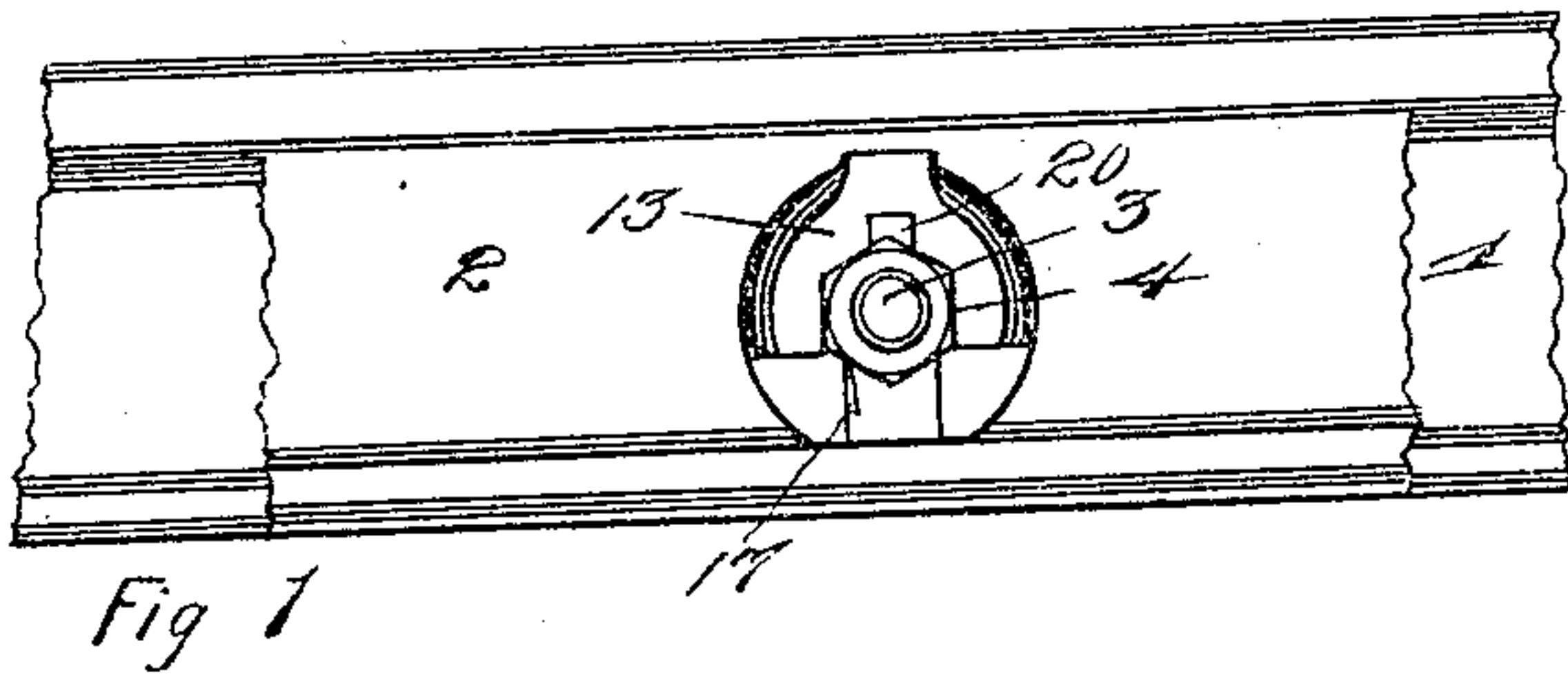
Patented Oct. 4, 1898.

C. MILLER.
NUT LOCK.

(Application filed Dec. 23, 1897.)

2 Sheets—Sheet 1.

(No Model.)



Witnesses
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J. M. Brown.

Conrad Miller Inventor
By his Attorney W. H. Harrison

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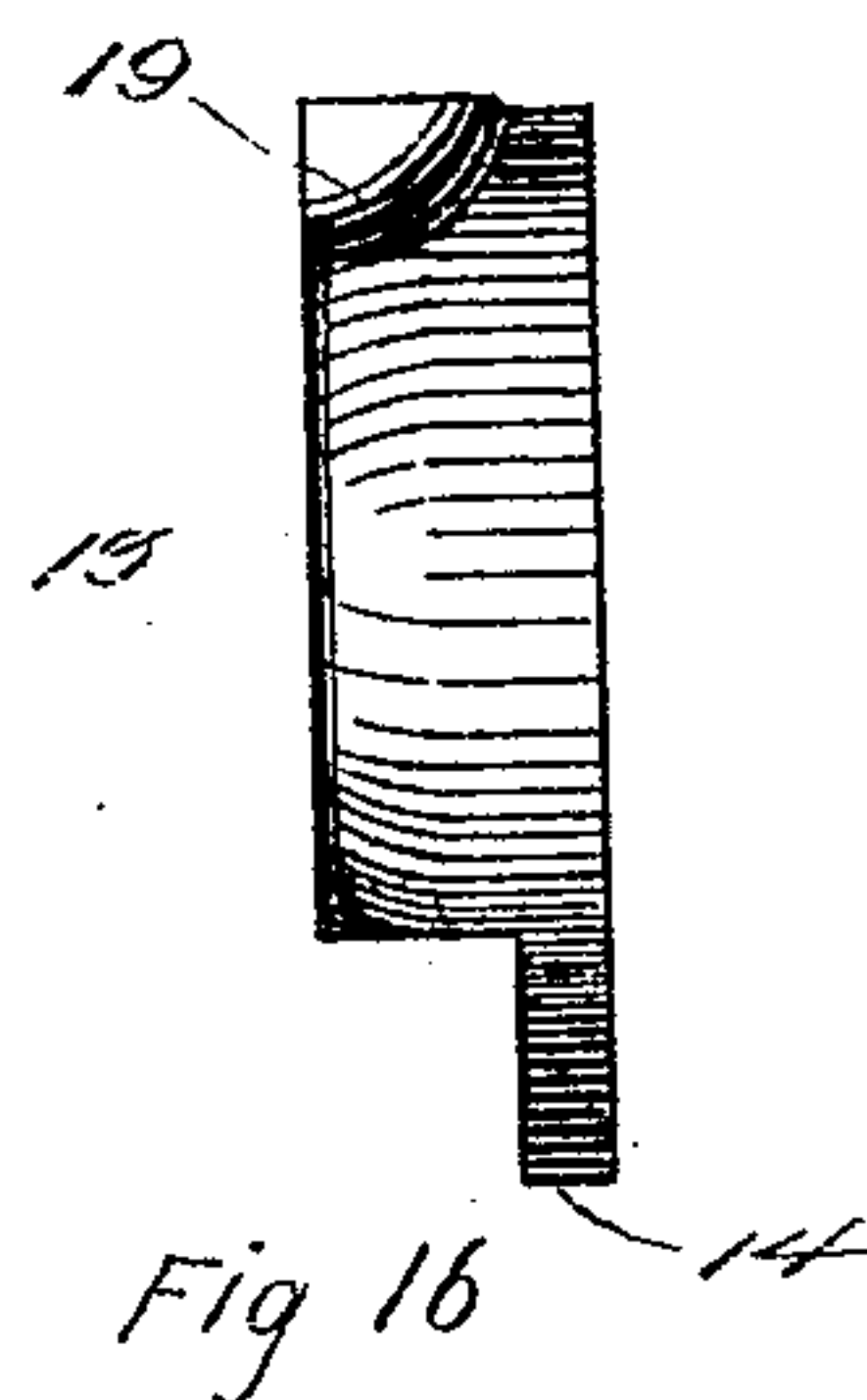
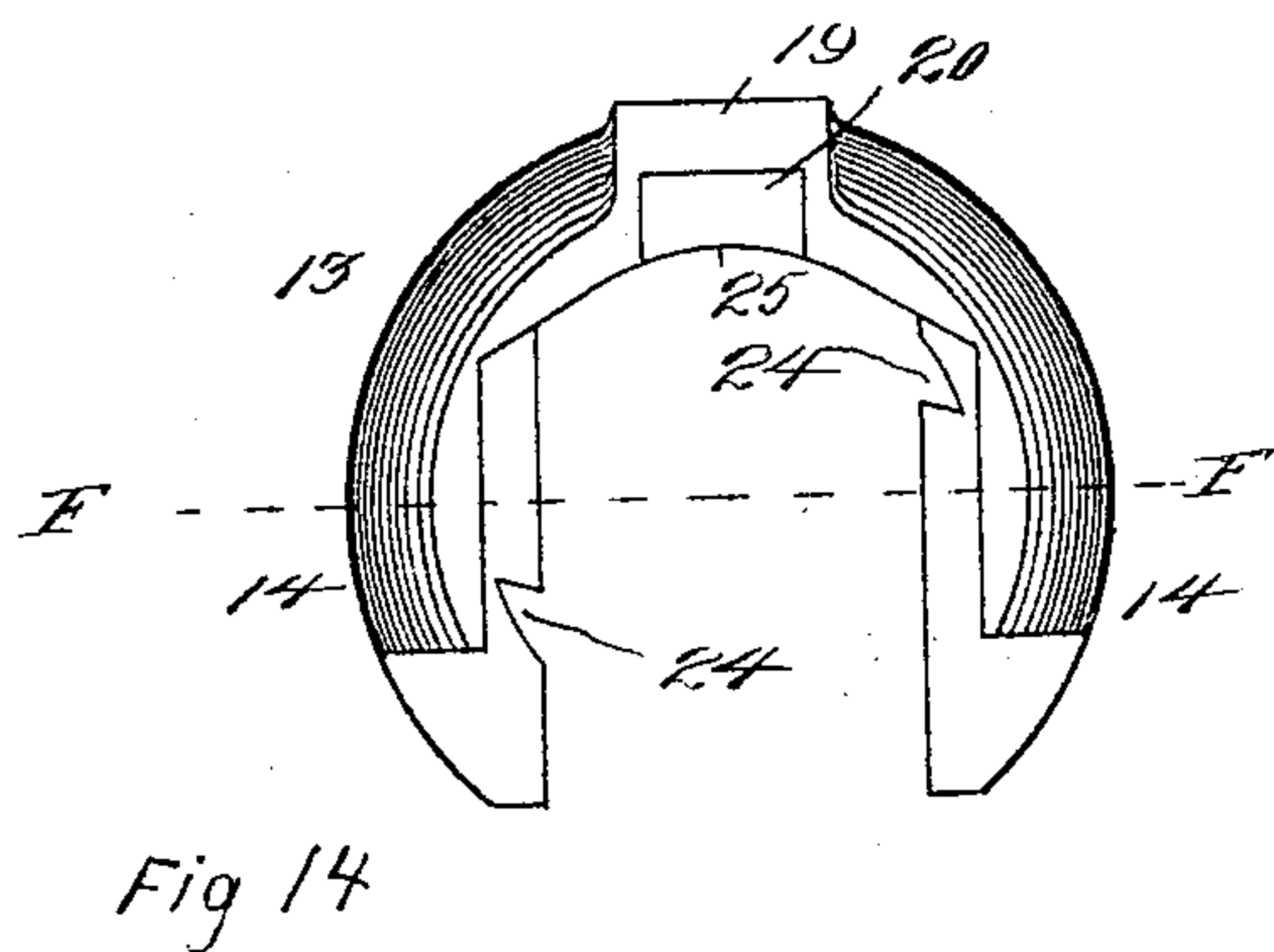
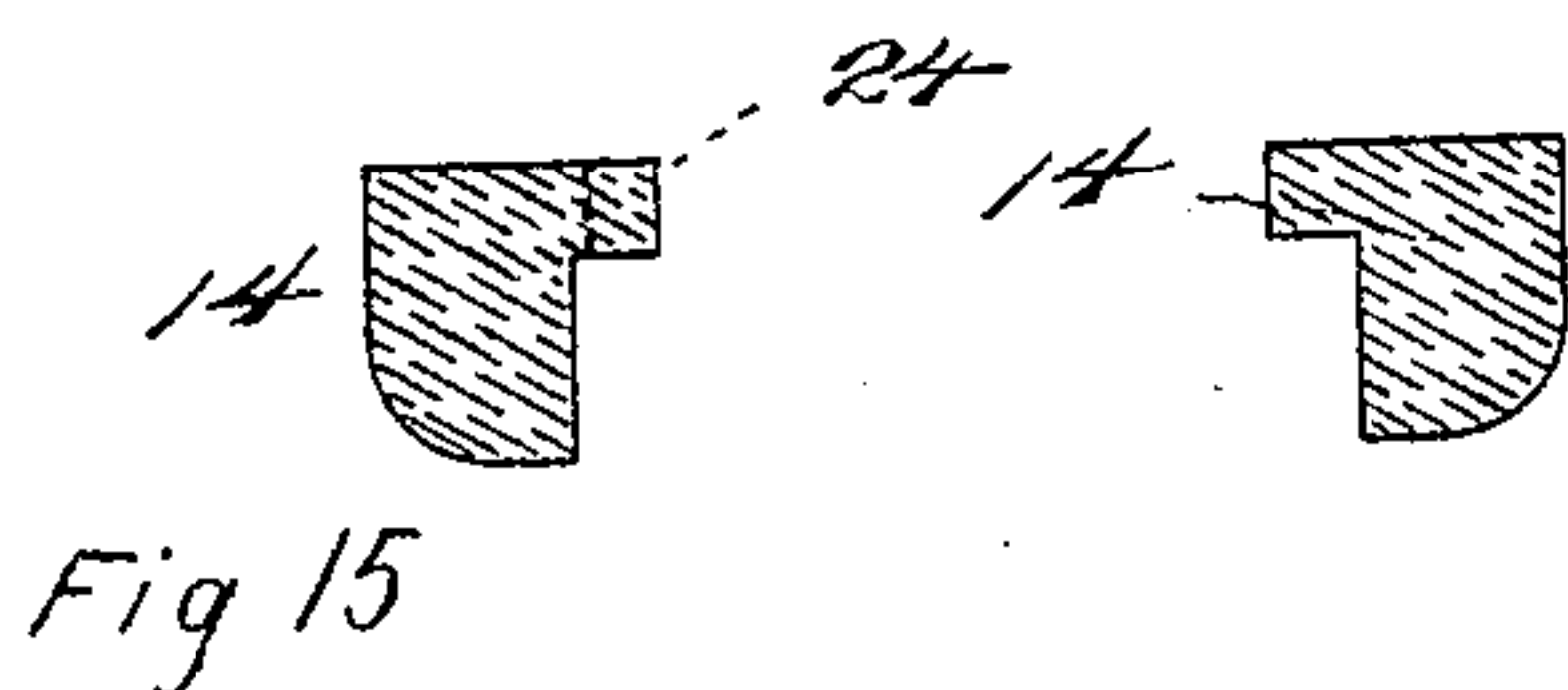
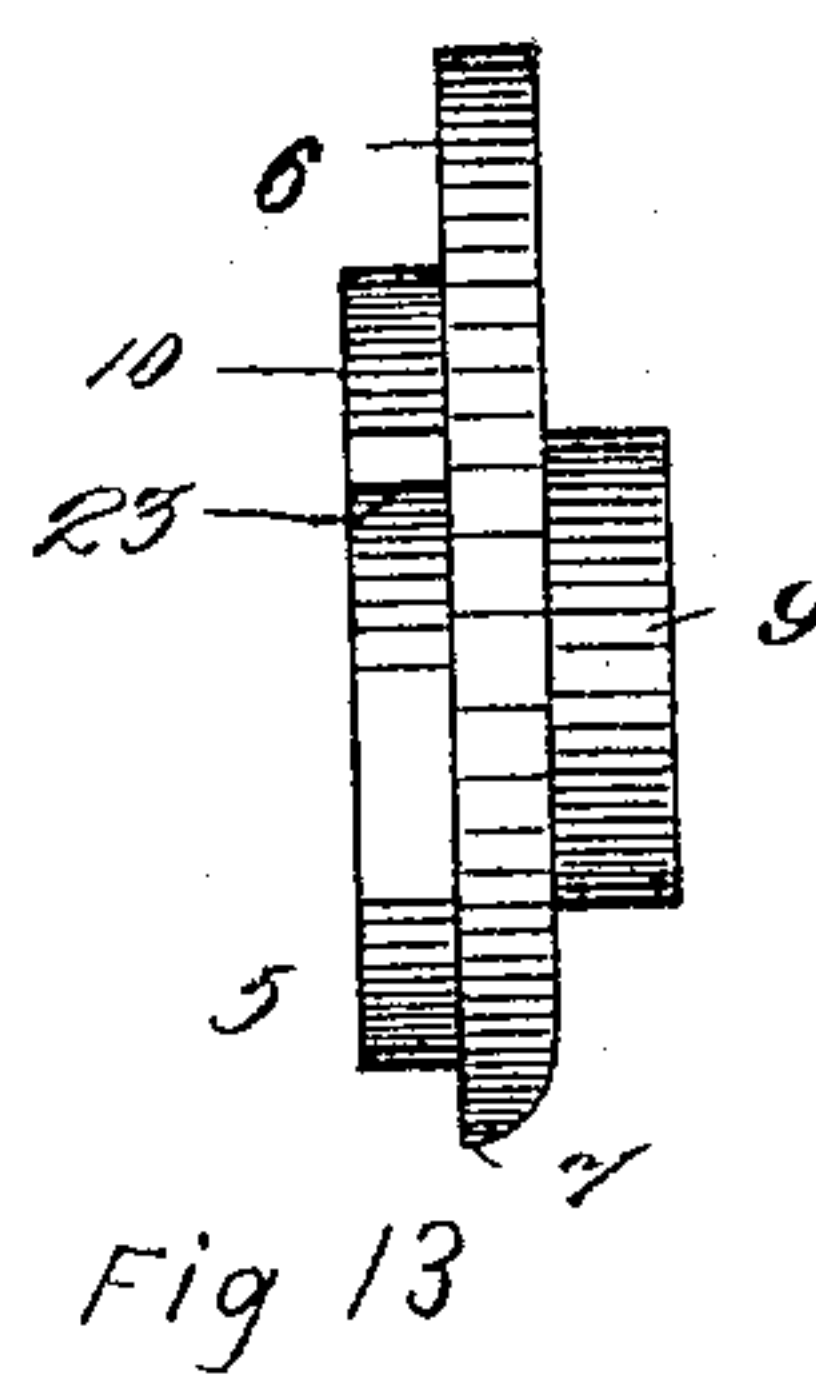
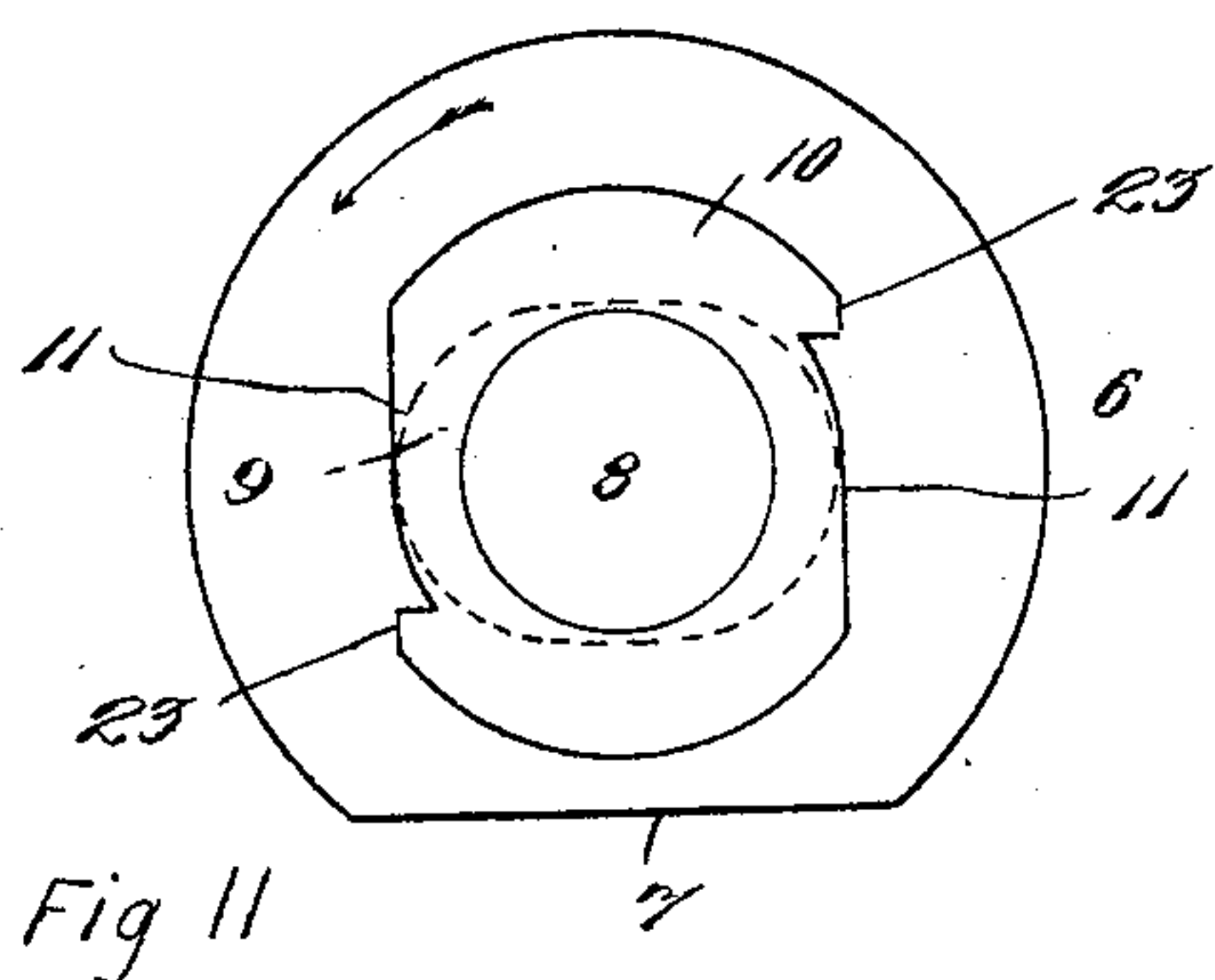
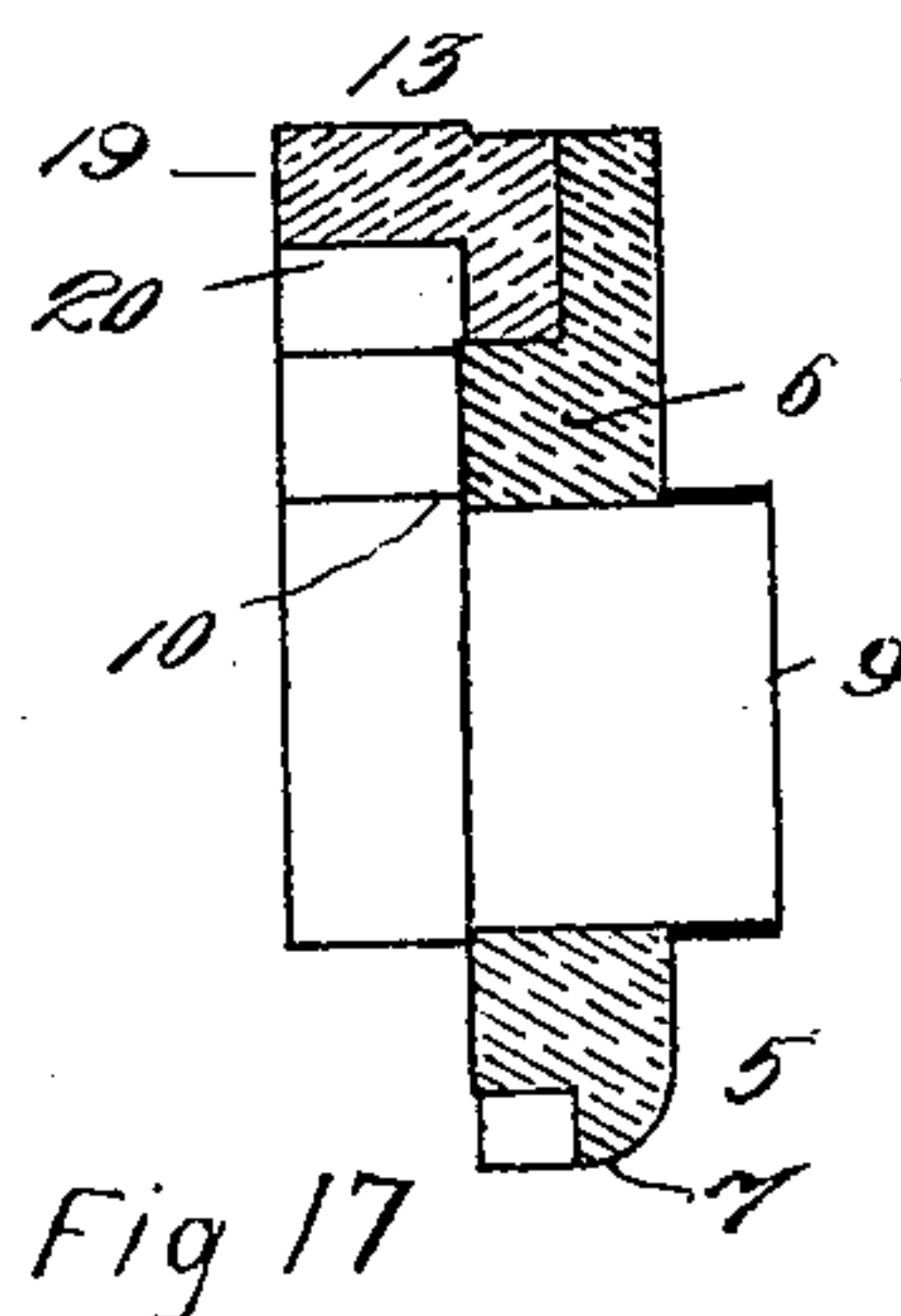
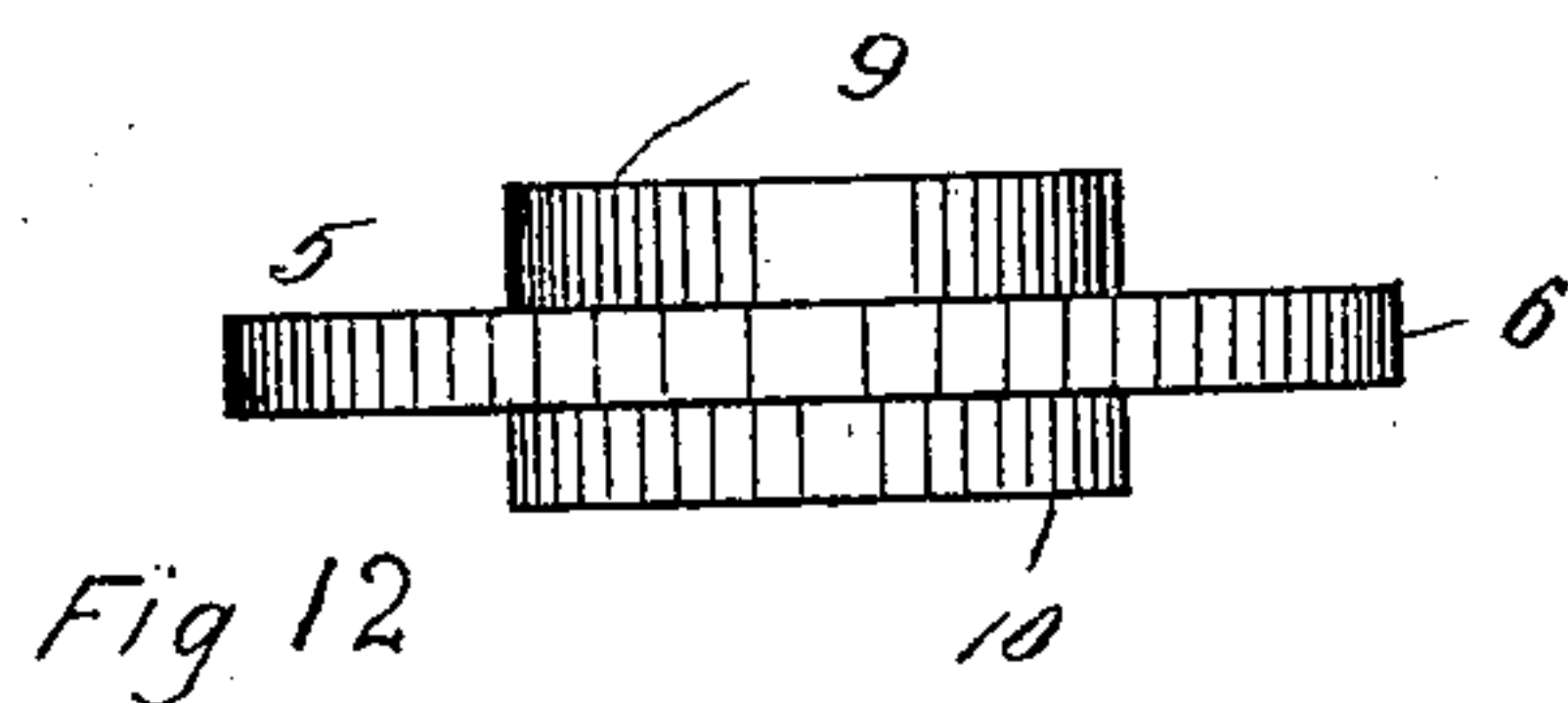
Patented Oct. 4, 1898.

C. MILLER.
NUT LOCK.

(Application filed Dec. 23, 1897.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses
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UNITED STATES PATENT OFFICE.

CONRAD MILLER, OF LEADVILLE, COLORADO.

NUT-LOCK.

SPECIFICATION forming part of Letters Patent No. 611,815, dated October 4, 1898.

Application filed December 23, 1897. Serial No. 663,149. (No model.)

To all whom it may concern:

Be it known that I, CONRAD MILLER, a citizen of the United States, residing at Leadville, in the county of Lake and State of Colorado, have invented certain new and useful Improvements in Nut-Locks; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to improvements in nut-locks.

The object of the invention is to provide a device of the character mentioned which is so constructed that the same is adapted to positively retain nuts upon bolts, and thus effectually overcome liability to accidents arising from the loosening and displacement of the nuts due to vibration and other causes.

A further object of the invention is the provision of a nut-lock comprehending a washer and a key, with suitable interlocking devices, which key, while being adapted to engage the nut to prevent rotation of the latter, is also designed to be readily disengaged therefrom in order that the nut may be removed from the bolt or adjusted when desired.

With these and other objects in view, which will appear as the nature of the improvements is better understood, the invention consists, substantially, in the novel construction, combination, and arrangement of parts, as will be hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation of a nut-lock constructed in accordance with the present invention and illustrated as applied to a rail. Fig. 2 is an edge view thereof. Fig. 3 is a side elevation, on an enlarged scale, of the washer. Fig. 4 is a sectional plan view thereof on the line A A, Fig. 3. Fig. 5 is a vertical sectional view on the line B B, Fig. 3. Fig. 6 is a similar view on the line C C, Fig. 3. Fig. 7 is a side elevation of the key. Fig. 8 is a sectional plan view thereof on the line D D, Fig. 7. Fig. 9 is a vertical sectional view on the line E E, Fig. 7. Fig. 10 is a side elevation of the washer shown in Fig. 3, slightly modified. Fig. 11 is a similar view of the washer employed with another form of the invention. Fig. 12 is a plan view thereof. Fig. 13 is an edge view. Fig. 14 is a side elevation of the

key employed with the washer illustrated in Fig. 11. Fig. 15 is a sectional plan view thereof on the line F F, Fig. 14. Fig. 16 is an edge view. Fig. 17 is a vertical sectional view illustrating the key shown in Fig. 14 as applied to the washer disclosed in Fig. 11.

Referring to the drawings, the numeral 1 designates a rail, 2 the fish-plates applied thereto in the usual manner, 3 a bolt passing through the rail 1 and fish-plates 2, and 4 a nut mounted on said bolt, all of which may be of any desired construction.

The numeral 5 designates a washer which comprises a disk 6, having one of its edges squared, as at 7, and partially rounded at one of its sides, whereby said squared edge is adapted to fit the angle between the body of the fish-plate and its base-flange and bear against the latter in order to prevent rotation of the disk 6. The disk 6 is also provided with a central bolt-aperture 8, and extending from one face of said disk is an elliptical extension 9, (clearly shown in dotted lines of Fig. 3,) which extension is adapted to fit a correspondingly-shaped opening formed in the object against which the washer is placed, so as to prevent rotation of said washer.

Projecting from the face of the disk 6 which is opposite to that whereon the extension 9 is formed is a neck 10, and it will be observed that said neck has its opposite sides cut away and flattened to provide engaging surfaces 11. By reason of forming the surfaces 11 in the manner stated it will be seen that the neck 10 is provided with a retaining-flange 12 adjacent to each of said surfaces, and said flanges are adapted to securely hold a key 13 on the neck 10.

The key 13 is of inverted-U shape, the legs 14 of which are adapted to lie between the disk 6 and the flanges 12 and upon the engaging surfaces 11, and it will thus be seen, as before stated, that the key 13 is retained upon the neck 10, but is capable of free vertical movement thereon. Formed on the inner face of the key 13 is a triangularly-arranged series of locking-lugs 15, one of which is located at the lower end of each of the legs 14 and one at a central point on the upper portion of the key, and said lugs are designed to enter and move within a triangularly-arranged series of grooves 16, the latter being

formed in the disk 6 and disposed one at each side of the neck 10 and one directly above the center thereof. Each of the grooves 16 is provided with an inclined lateral offset 17; but it will be observed that while the offsets of the side grooves are arranged at corresponding sides thereof the offset of the upper groove is reversed thereto in its location, whereby when the key 13 is placed upon the neck 10 and partially rotated thereon in the direction of the arrow the lugs 15 will enter the offsets 17 and thereby lock the key against vertical movement, and hence prevent its displacement. It will of course be understood that this partial rotation of the key 13 is very slight, and for permitting the same the upper end of one of the engaging surfaces 11 and the lower end of the other is cut away, as at 18, said cut-away portions being diagonally opposite and designed to receive the inner sides of the legs 14 when the key is turned.

An inverted-U-shaped hood 19 is formed on the outer face of the key 13, which hood is adapted to embrace the sides of the nut on the bolt when the key is properly positioned on the washer, and it is thus evident that when so engaged with the nut the latter is prevented from rotating. A recess 20 is cut in the upper portion of the hood 19 for the reception of a suitable instrument designed to move the key 13 upwardly for freeing the same from the nut, and for sustaining said key in such elevated position to permit adjustment of the nut each of the flanges 12 has its inner face notched to provide a shoulder 21, upon which shoulders the lower ends of the legs 14 may rest to support the key in the position mentioned, the outer face of the disk 6 being depressed, as at 22, for receiving the legs 14, so as to conveniently position the latter upon the shoulders 21. The notched portions of the flanges 12 will also facilitate insertion and removal of the lugs 15 in and from the grooves 16.

In Fig. 10 is shown a slightly-modified form of the washer illustrated in Fig. 3, and it will be noted that the former is substantially the same as the latter, excepting that the grooves 16 extend to the edges of the disk 6 and the flanges 12 are entirely dispensed with. Since the flanges 12 are adapted to retain the key upon the neck, it is obvious that some provision must be made as a substitute for said flanges, and hence the nut employed with the washer shown in Fig. 10 is made of greater diameter than the neck of the latter. Consequently the nut overlaps the legs 14 of the key and effectually retains said key in proper position.

Figs. 11 to 17, inclusive, show another form of the invention, and referring thereto it will be seen that the construction of the washer and key is substantially the same as in the other forms; but the means for interlocking said parts are different. The flanges 12 are dispensed with, and in lieu of the locking-lugs 15 and the grooves 16, with their offsets

17, the neck 10 has each of its engaging surfaces 11 cut away to form a locking-hook 23, which hooks are diagonally opposite and reversely arranged. The key 13 in this instance has the inner edge of each of its legs 14 provided with a notch 24, and said notches are also diagonally opposite and reversely arranged. By reason of this it will be seen that the notches 24 correspond with the hooks 23, the latter being adapted to enter said notches when the key is partially rotated, and thus lock said key into engagement with the washer. As in Fig. 10, the nut employed with this last form is of greater diameter than the diameter of the neck 10, and thus overlaps the legs 14 of the key and prevents the same being separated from the washer.

In all the forms of the lock it is to be noted that the upper portion of the key 13 is segmentally curved, as at 25, whereby said key may snugly fit the neck 10 and work thereon.

The manner of applying the form shown in Figs. 1 to 10, inclusive, is as follows: While illustrated as applied to a railroad-rail, it is of course obvious that the lock may be employed upon various things, such as machinery and the like, and after the washer 5 has been placed against the parts to be secured together the bolt is passed through the aperture 8. The nut is now screwed upon the bolt, and when the former contacts with the neck 10 the key 13 is placed on the latter. This is accomplished by inserting the locking-lugs 15 into the grooves 16, after which the key is allowed to descend, so that the hood 19 may snugly fit the nut upon the bolt. When this has been effected, the nut is turned in the direction of the arrow, which movement causes a corresponding movement of the key 13, whereby the lugs 15 are caused to enter the offsets 17, and thus lock the key upon the washer. The former is now incapable of any vertical movement whatever, nor can said key be separated from the washer, and since the legs 14 lie upon the engaging surfaces 11 it will also be seen that the key cannot rotate beyond the limited extent necessary for engaging and disengaging the lugs 15 with and from the offsets 17. Hence the nut cannot rotate, but is securely held upon the bolt. To release the nut, the same is turned in a direction opposite to that necessary for locking, which movement partially rotates the key 13 and causes the lugs 15 to again enter the grooves 16. By inserting a suitable instrument into the recess 20 the key 13 can now be moved upwardly, thus releasing the hood 19 from the nut and enabling the latter to be removed. If it is desired to retain the key in its elevated position, the lower ends of the legs 14 are seated upon the shoulders 21 of the flanges 12, and any adjustment of the nut may then be conveniently made.

The manner of using the form shown in Figs. 11 to 17, inclusive, is substantially the same as just described, and it will be seen

that when the nut is turned in the direction of the arrow the key 13 will be correspondingly moved and the hooks 23 caused to enter the notches 24, thereby locking the key upon the washer and also locking the nut against rotation.

From the foregoing it will be seen that the herein-described invention provides a nut-lock which is very efficient, and while the same is adapted for use with nuts employed in a variety of ways it is especially valuable for application to nuts of bolts used in securing fish-plates to rails. When the nut is locked in the manner described, it is evident that loosening thereof is positively prevented, and hence the necessity for continued tightening with a wrench is obviated, and it is also apparent that the lock provides an absolute safeguard against accidents arising from displacement of nuts due to vibration and other causes. Moreover, the invention is equally adapted for use with bolts having left-hand threads as with those provided with right-hand threads.

If desired, the key may be cast or stamped with a die, and the washer may also be cast or stamped with a die integral with or separate from one of the objects to be bolted together.

While the forms herein shown and described are what are believed to be preferable embodiments of the invention, it is to be understood that the latter is susceptible of various changes in the form, proportion, and minor details of construction which may be resorted to, and the right is therefore reserved to modify or vary the invention as falls within the spirit and scope thereof.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. A nut-lock, comprising a series of members, one of which is capable of rotation with relation to the other, whereby said rotatable member is locked into engagement with or disengaged from the other member, and a hood carried by said rotatable member for engaging a nut to lock the latter against rotation, substantially as described.

2. A nut-lock, comprising a washer provided with a neck, and a U-shaped key mounted on said neck and capable of rotation with relation to the washer, whereby the key is locked into engagement with or disengaged from the washer, substantially as described.

3. A nut-lock, comprising a washer, a key capable of rotation with relation to the washer, whereby the former is locked into engagement with or disengaged from the latter, and a hood carried by the key for embracing a nut to lock the latter against rotation, substantially as described.

4. A nut-lock, comprising a washer provided with a neck, a U-shaped key mounted on said neck and capable of rotation with relation to the washer, whereby the key is locked into engagement with or disengaged from the

washer, and a hood carried by the key for embracing a nut to lock the latter against rotation, substantially as described.

5. A nut-lock, comprising a washer provided with a neck having engaging surfaces formed on its sides, a U-shaped key mounted on said neck and having its legs extending along said engaging surfaces, suitable interlocking devices between the key and washer, and means carried by the key for engaging a nut to lock the latter against rotation, substantially as described.

6. A nut-lock, comprising a washer provided with a neck having engaging surfaces formed on its sides, a U-shaped key mounted on said neck and having its legs extending along said engaging surfaces, suitable interlocking devices between the key and washer, and a hood carried by the key for embracing a nut to lock the latter against rotation, substantially as described.

7. A nut-lock, comprising a washer provided with a neck having engaging surfaces formed on its sides, a U-shaped key mounted on said neck and having its legs extending along said engaging surfaces, suitable interlocking devices between the key and washer, and a hood carried by the key for embracing a nut to lock the latter against rotation, said hood being provided with a recess adapted to receive a suitable instrument for freeing the key from the nut, substantially as described.

8. A nut-lock, comprising a washer, a hook formed on said washer, and a key provided with a notch adapted to receive said hook, whereby the key is locked into engagement with the washer, substantially as described.

9. A nut-lock, comprising a washer provided with a neck, hooks formed on said neck, and a key mounted on the neck and provided with notches adapted to receive said hooks, whereby the key is locked into engagement with the washer, substantially as described.

10. A nut-lock, comprising a washer provided with a neck, hooks formed on said neck, a key mounted on the neck and provided with notches adapted to receive said hooks, whereby the key is locked into engagement with the washer, and a hood carried by the key for embracing a nut to lock the latter against rotation, substantially as described.

11. A nut-lock, comprising a washer, hooks formed on said washer and arranged diagonally opposite, and a key provided with diagonally opposite notches adapted to receive said hooks, whereby the key is locked into engagement with the washer, substantially as described.

12. A nut-lock, comprising a washer provided with a neck, diagonally opposite reversely-arranged hooks formed on said neck, and a key mounted on the neck and provided with diagonally opposite reversely-arranged notches adapted to receive said hooks, whereby the key is locked into engagement with the washer, substantially as described.

13. A nut-lock, comprising a washer pro-

- vided with a neck, diagonally opposite reversely-arranged hooks formed on said neck, a key mounted on the neck and provided with diagonally opposite reversely-arranged notches adapted to receive said hooks, whereby the key is locked into engagement with the washer, and a hood carried by the key for embracing a nut to lock the latter against rotation, substantially as described.
- 10 14. A nut-lock, comprising a washer provided with a neck having engaging surfaces formed on its sides, diagonally opposite reversely-arranged hooks formed on said neck, a U-shaped key mounted on said neck and
- 15 having its legs extending along said engaging surfaces, said legs being provided with diagonally opposite reversely-arranged notches adapted to receive said hooks, whereby the key is locked into engagement with the
- 20 washer, and a hood carried by the key for embracing a nut to lock the latter against rotation, substantially as described.
15. A nut-lock, comprising a washer provided with a neck having engaging surfaces
- 25 formed on its sides, diagonally opposite reversely-arranged hooks formed on said neck, a U-shaped key mounted on said neck and having its legs extending along said engaging surfaces, said legs being provided with di-
- 30 agonally opposite reversely-arranged notches adapted to receive said hooks, whereby the key is locked into engagement with the washer, and a hood carried by the key for
- 35 embracing a nut to lock the latter against rotation, said hood being provided with a recess adapted to receive a suitable instrument for freeing the key from the nut, substantially as described.
- 40 16. A nut-lock, comprising a washer provided with a neck having engaging surfaces formed on its sides, a U-shaped key mounted on said neck and having its legs extending along said engaging surfaces, and suitable

interlocking devices between the key and washer, said key being capable of rotation 45 with relation to the washer, whereby the former is locked into engagement with or disengaged from the latter, substantially as described.

17. A nut-lock, comprising a washer, a hook 50 formed on said washer, and a key provided with a notch adapted to receive said hook, said key being capable of rotation with relation to the washer, whereby the former is locked into engagement with or disengaged 55 from the latter, substantially as described.

18. A nut-lock, comprising a washer provided with a neck, diagonally opposite reversely-arranged hooks formed on said neck, a key mounted on the neck and provided 60 with diagonally opposite reversely-arranged notches adapted to receive said hooks, said key being capable of rotation with relation to the washer, whereby the former is locked into engagement with or disengaged from 65 the latter, and means carried by the key for engaging a nut to lock the latter against rotation, substantially as described.

19. A nut-lock, comprising a washer provided with a neck, diagonally opposite reversely-arranged hooks formed on said neck, a key mounted on the neck and provided 70 with diagonally opposite reversely-arranged notches adapted to receive said hooks, said key being capable of rotation with relation 75 to the washer, whereby the former is locked into engagement with or disengaged from the latter, and a hood carried by the key for embracing a nut to lock the latter against rotation, substantially as described. 80

In testimony whereof I affix my signature in presence of two witnesses.

CONRAD MILLER.

Witnesses:

KUND RASMUSSEN,
H. E. WILLIAMS.