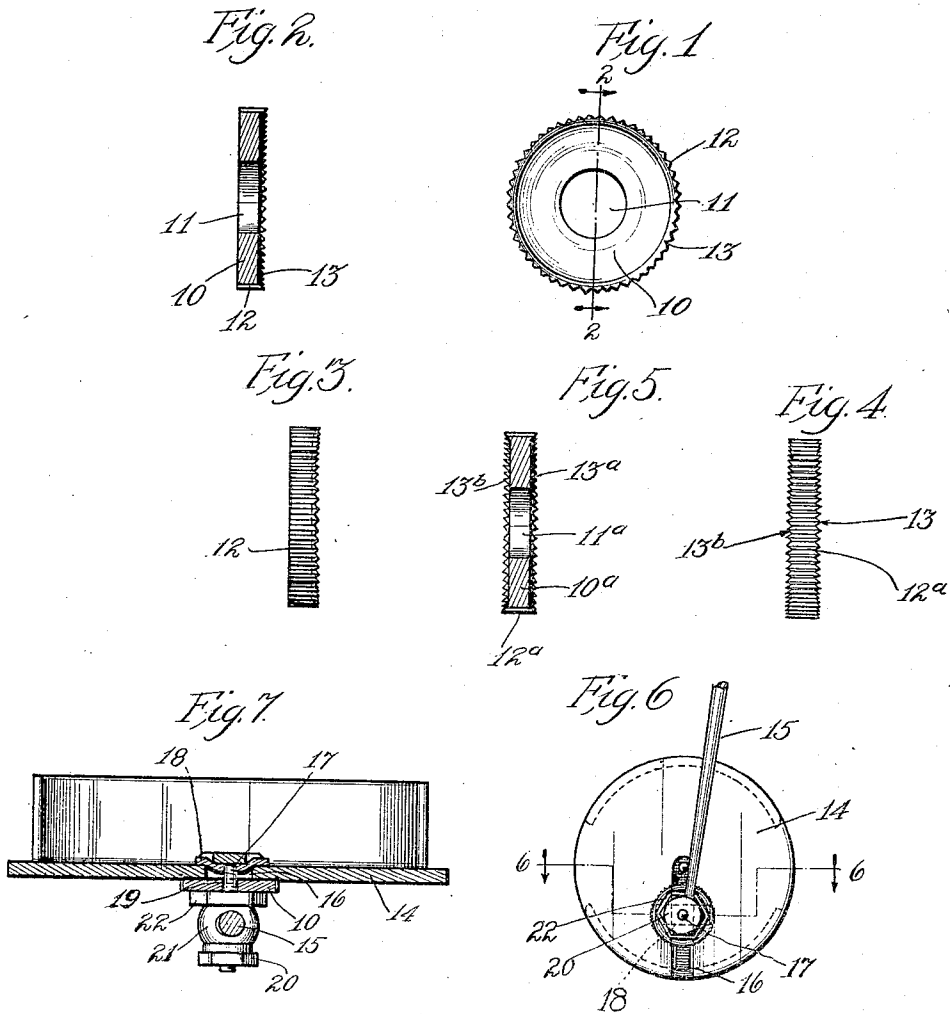


C. B. HALE.
WASHER.
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UNITED STATES PATENT OFFICE.

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COPARTNERSHIP CONSISTING OF CHARLES BALLARD HALE, EDWARD E. EMMERICH,
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WASHER.

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To all whom it may concern:

Be it known that I, CHARLES BALLARD HALE, a citizen of the United States, residing at Park Ridge, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Washers, of which the following is a specification.

This invention relates to washers, and has for its object, the provision of a device of this character, which will act as a lock, and at the same time will not radically depart from the form and appearance of the washers now commonly in use.

With the above and other objects in view, as will be apparent, this invention consists in the construction, combination, and arrangement of parts all as hereinafter more fully described, claimed, and illustrated, in the accompanying drawing wherein:—

Figure 1 is an elevation of a washer constructed in accordance with the present invention;

Fig. 2 is a vertical section along line 2—2 of Fig. 1;

Fig. 3 is an edge elevation of the washer, illustrated in Figs. 1 and 2;

Fig. 4 is an elevation of a modified form of the present invention;

Fig. 5 is a central vertical section of the form of invention illustrated in Fig. 4;

Fig. 6 is an elevation of an adaption of the present washer illustrating one of the uses thereof, and

Fig. 7 is a section taken along line 7—7 of Fig. 6.

As is well known, heretofore in the arts it has been customary to place a washer upon a bolt or pin beneath the nut, and this is equally true where the bolt or pin is stationary, or adjustable in a slot or guide of a relatively stationary element. Experience has demonstrated that, in the case of a stationary or fixed bolt the nut gradually loosens, unless some preventive means is adopted, while in the case of the adjustable bolt, great clamping pressure between the head of the bolt and the nut is required to hold the bolt fixed in any of its adjusted positions. To overcome the loosening of nuts in any of their varied uses, and to decrease to a minimum the clamping pressure necessary to hold an adjustable bolt fixed in its adjusted positions, is the function of the present invention. This is accomplished entirely

through the medium of this improved washer, which in its size and appearance does not, as is apparent from the drawing, differ greatly from the washers prior hereto.

Referring now to the drawings, Figs. 1 and 2 illustrate one form of the present invention, while Figs. 6 and 7 illustrate this form in one of its uses. The body of the washer is centrally pierced by the opening 11 which receives the bolt encircled by the washer. The periphery of the washer 10 is milled or otherwise specially knurled as at 12 to form the toothed bur 13, encircling and projecting laterally from one face of the washer. While the bur 13 varies in its size, proportionately to the size of the washer, it is, in its preferred form, small as compared to the size and weight of the washer.

The utility of this form of washer is apparent from a consideration of Figs. 6 and 7, wherein 14 designates a rotary element or crank adapted to drive a crank rod or similar element 15. A slidable and pivotal connection is provided between the crank 14 and the rod 15 and comprises a slot 16 radiating from the center of said crank in which the bolt 17 with its integral head 18, is arranged to reciprocate. This bolt 17 is threaded as at 19 adjacent to its head 18 and also at its outer end for the mounting of the outer nut 20. A wrist 21 encircles the bolt 17 between these sets of threads and is loosely mounted on said bolt, it being held in place by the nut 20 in such manner that it is free to oscillate on the bolt 17 and thus pivotally connect the rod 15 thereto. A nut 22 is threaded on the portion 19 of the bolt or pin 17 and bears against the washer 10; so that by tightening the nut 22 the toothed bur 13 of the washer will bite into the surface of the crank 14 and clamp said crank 14 between it and the head 18 of said bolt or pin 17. By its biting action into the face of the crank 14, the washer 10 holds the bolt 17 in its adjusted positions, without any great clamping pressure on the part of the nut 22.

The modified form of the washer illustrated in Figs. 4 and 5, demonstrates the formation and construction of the present invention when especially adapted for the engagement and locking of two parts, one on each side of the washer, as in the case of a bolt lock for the bolts of rail-joints, clock

mechanisms and the like. With reference to these two views 10^a designates the body of the washer provided with the central bolt or pin hole 11^a. The periphery of this washer 5 is milled or otherwise specially knurled as at 12^a to form the toothed burs 13^a and 13^b encircling and extending laterally from each face of the washer 10^a.

In the use of this form of the invention 10 one toothed locking bur 13^a bites into the element through which the bolt or pin passes; while the other toothed biting bur 13^b bites into the head of the bolt; thus the bur 13^a prevents the washer from turning and the 15 bur 13^b locks the bolt and prevents it from loosening.

Manifestly the washer may be of any size or thickness, and may also be formed integrally with other and cooperating elements, as desired. Furthermore, the present invention is obviously adapted for use in connection with any mechanism wherein a locking action of this character is desired, it being adapted even where the conventional washer structure is not used or desirable. 20 25

What is claimed is:

As an article of manufacture, a washer having a knurled edge, the knurling projecting laterally beyond a face of the washer so as to form a series of relatively small biting 30 burs.

CHARLES BALLARD HALE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."