

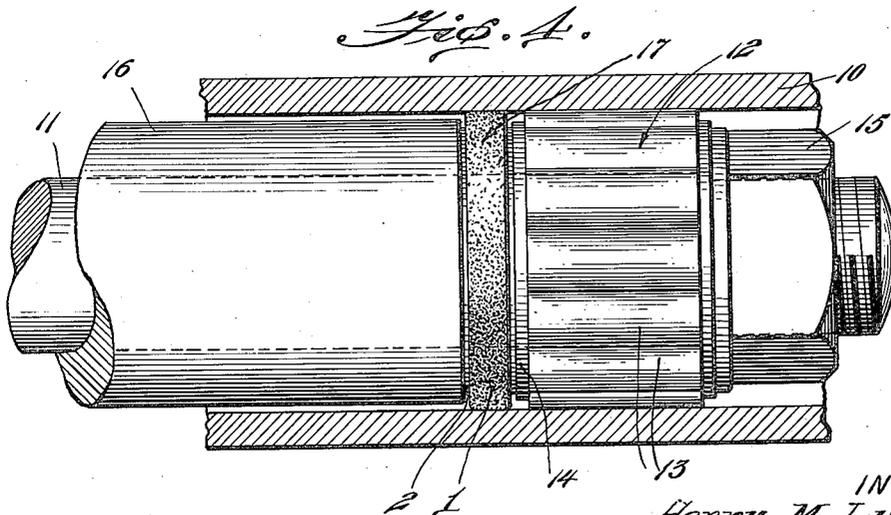
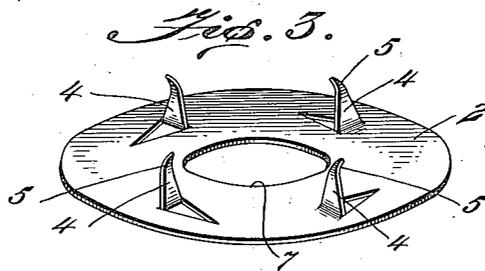
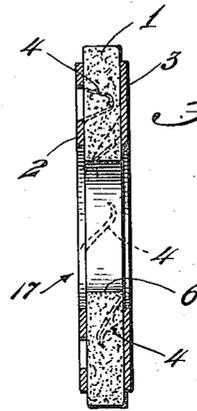
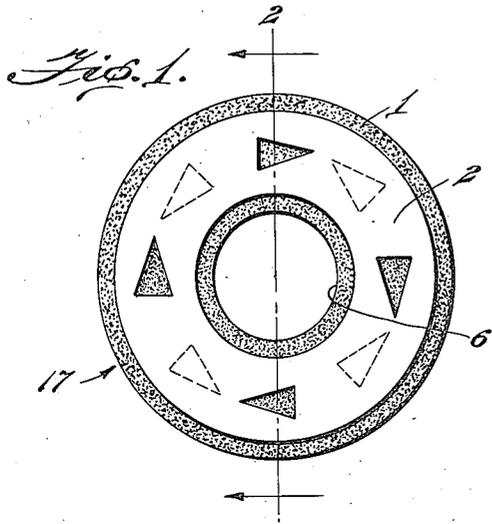
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H. M. LYNCH ET AL

WASHER

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# UNITED STATES PATENT OFFICE.

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## WASHER.

Application filed October 15, 1921. Serial No. 507,974.

*To all whom it may concern:*

Be it known that we, HENRY M. LYNCH and LEWIS E. ELLIOTT, citizens of the United States, residing at Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Washers, of which the following is a specification.

This invention relates to an improved washer, and has among its objects to provide a device of this character which is built up or formed of separate parts secured together in such a manner as to provide a unitary reinforced washer structure wherein the usual soft compressible material forming the main body portion of the washer is so supported as to constantly retain its proper form and be protected against wear.

Another object of the invention is to provide a device of this character wherein metallic plates positioned upon opposite sides of the filler material are each provided with integral prongs, preferably struck out therefrom, and adapted to be embedded in the filler material, by means of pressure, to hold the plates against separation from the filler and against rotation relative thereto.

Another object of the invention is to provide a device of this character wherein the prongs are so formed as to insure suitable penetration of the filler when pressed into the filler material and a proper bending of the same within the material to effectively retain the parts in proper position and hold them against separation.

Other objects and advantages of the invention relate to certain novel details of construction and methods of forming the same as will be more fully set forth in the detailed description to follow.

Referring to the drawings:

Fig. 1 is a plan view of the washer;

Fig. 2 is a transverse sectional view of the same.

Fig. 3 is a perspective view of one of the metallic plates; and,

Fig. 4 is a detail sectional view showing the washer in the position which it may assume in practice.

In the embodiment of the invention illustrated herewith 1 designates the filler portion of the washer which may be of felt, cork, fibre, or other suitable material such as is adapted to absorb lubricants or prevent the flow of lubricants or other liquids

to portions of mechanism from which it is desired that they be excluded.

2 and 3 designate metal reinforcing plates which are preferably hardened sufficiently to enable them to maintain their form when exposed to a certain degree of strain, and thus prevent the structure from becoming distorted by reason of excessive strain unequally applied to portions of its surface.

The plates 2 and 3 are similarly constructed, each being provided with a plurality of prongs 4 which are preferably struck out from the body portion of the plate by means of dies, and appear, before the parts are assembled, substantially as shown in Fig. 3 of the drawings.

The tip of each prong is preferably bent slightly as indicated at 5 to insure the entry of the same into the filler material and that the prong will be bent in the desired direction, that is in the direction of the opening in the plate from which it has been struck out, as the point passes through the filler material and contacts with the inner surface of the plate upon the opposite side thereof. The filler material 1 is in the form of an annulus being provided with a central opening 6 for the reception of a shaft, and the diameter of the filler 1 is somewhat greater than that of the plates 2 and 3 so that the periphery thereof may extend beyond the peripheries of the plates 2 and 3 when the parts are in assembled position and contact with the interior surface of a cylindrical member within which it may be placed. Each of the plates 2 and 3 is also provided with a central opening 7 of somewhat larger diameter than the opening 6 formed in the filler whereby when the metal plates are positioned upon opposite sides of the filler member the surface area of the filler member exceeds that of either of the plates and extends beyond the same both outwardly and inwardly along every line of cross section taken through the filler and plates and passing through the center of the annulus.

In assembling the parts to form the washer as shown in Figs. 1 and 2 of the drawings, the plates 2 and 3 are placed upon opposite sides of the filler 1 and pressure is exerted upon the parts to force the prongs 4 into the filler and against the inner surface of the opposite plate whereupon the prongs are bent slightly back upon themselves as shown in Fig. 2 of the drawings, and thus the plates

are secured to the filler with sufficient firmness to normally hold the parts together and form in effect a unitary structure.

It will be understood that the soft compressible material of which the filler is formed is somewhat compacted together by the pressure exerted in securing the plates to opposite sides thereof, and this compactness is retained to a considerable extent after the pressure is removed, thus providing a washer structure which tends to retain its form and compactness even under service conditions.

While as above described the metallic plates are preferably provided with integral prongs for penetrating the filler and holding the parts of the washer together it is to be understood that other equivalent means may be employed for this purpose which will fall within the scope of our invention as defined by the appended claim, such, for example, as the securing of the plates together through the filler material in any suitable or desired manner so as to positively attach the metallic plates to each other and hold the several parts against separation.

As illustrating one application of the invention there has been shown in Fig. 4 of the drawings, a portion of a cylindrical casing 10 within which is rotatably mounted a shaft 11 supported by a roller bearing 12, the rollers 13 thereof being confined in the usual cage 14, and a nut 15 being employed for holding the bearing against removal from the shaft. The shaft 11 rotates in a sleeve 16, and a washer 17 formed as above described is interposed between the sleeve 16 and the roller bearing cage 14. It will be seen from the structure as shown in Fig. 4 that the periphery of the filler member 1 contacts with the inner surface of the cylindrical casing to prevent excessive flow of lubricant from the interior of the casing, and the plates 2 and 3 upon opposite sides of the filler material bear against the relatively moving parts such as the sleeve 11 and the cage 14 to prevent wear upon the filler.

For purposes of illustration, there has

been shown one practical application of our improved washer, namely, the use of the same when positioned between relatively rotatable surfaces. It is to be understood however, that the structure shown and described has many other useful applications, and may be advantageously used between relatively non-rotatable members as well as relatively rotatable members, the arrangement of the parts and characteristics of the structure being such as to adapt it for use generally wherever washers of yielding material may be employed.

While we have shown and described in considerable detail one embodiment which our invention may assume in practice in order to make clear to those skilled in the art means for practically utilizing the same, it is to be understood that we do not desire or intend to be limited to the precise construction shown and described but that we may employ such equivalent arrangement of parts as may properly be included within the scope of the appended claim when broadly construed in the light of our invention.

Having thus described our invention, what we claim is:

In a washer of the character described, a layer of yielding material, annular reinforcing plates positioned upon opposite sides of said yielding material and each provided with integral prongs struck out from said plates, the prongs of the separate plates being arranged in non-registering relation and the prongs of each plate being adapted to engage the opposite plate upon the parts being pressed together whereby the prongs are bent back towards their respective plates to engage the material, said plates being thereby retained in position relative to each other solely through the engagement of said prongs with said yielding material while movement of the plates towards and from each other is permitted.

In testimony whereof we have affixed our signatures.

HENRY M. LYNCH.  
LEWIS E. ELLIOTT.