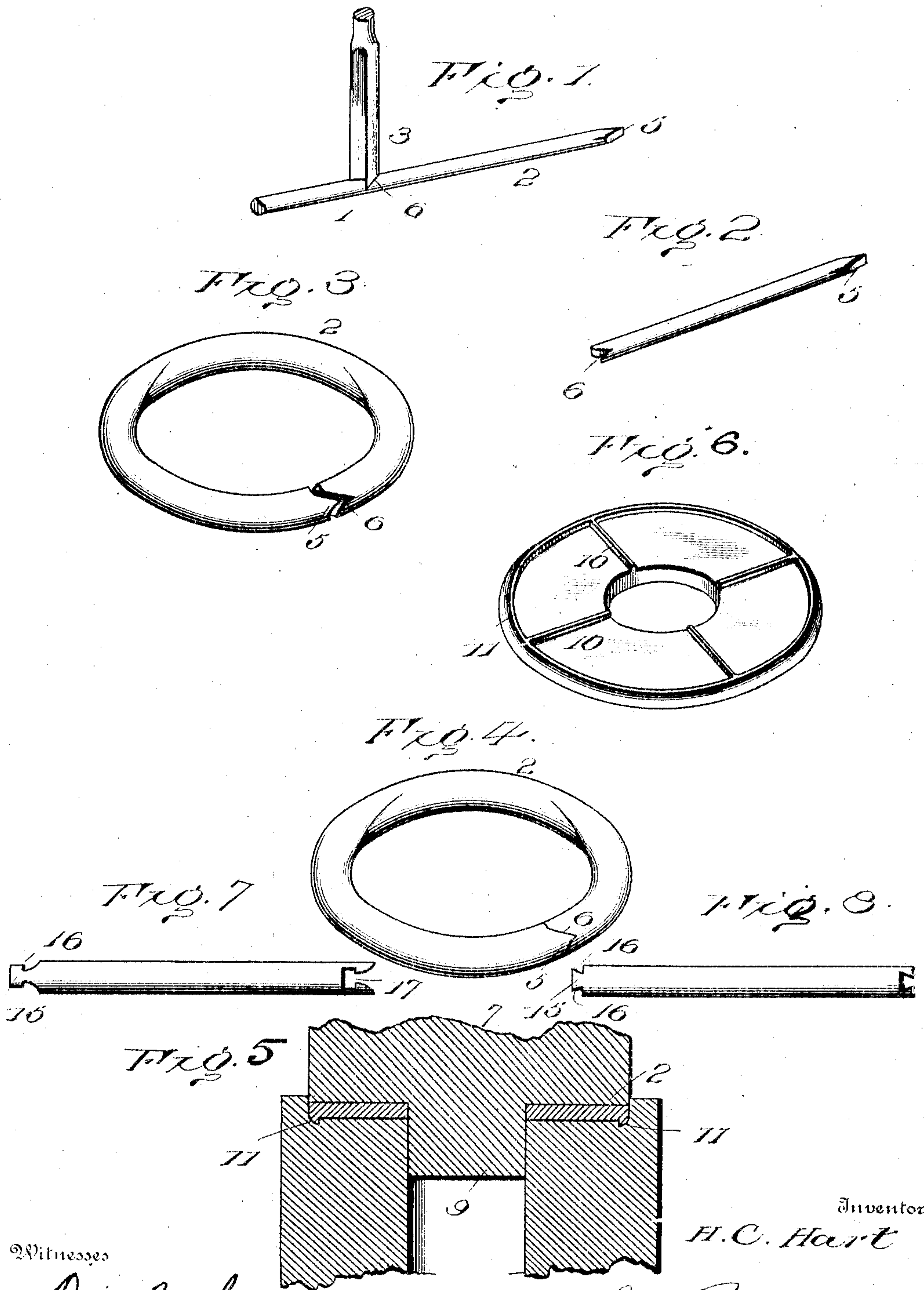


No. 766,882.

PATENTED AUG. 9, 1904.

H. C. HART.
ART OF MAKING WASHERS.
APPLICATION FILED MAR. 26, 1903.

NO MODEL.



Witnesses

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ART OF MAKING WASHERS.

SPECIFICATION forming part of Letters Patent No. 766,882, dated August 9, 1904.

Application filed March 26, 1903. Serial No. 149,711. (No model.)

To all whom it may concern:

Be it known that I, HUBERT CHAUNCEY HART, a citizen of the United States, residing at Unionville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in the Art of Making Washers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in the art of making washers.

It is my purpose to cut wire of desired thickness into sections of appropriate length and form at one end a tongue and at its opposite end a seat and then bring the two ends together and lock them. The ends being together, the ring thus formed is placed between dies whose diameter is equal that of the ring, and when they are brought together the thickness of the ring is greatly reduced, while its original diameter remains the same. The molecules of metal are thus greatly increased in density and the tongue is forced into its seat under such pressure that a washer is formed with the characteristics of one formed from sheet metal. The increased density of the metal is positively insured when it is considered that it is only its thickness which has been reduced, which readily forces the meeting ends into each other as to form a continuous piece of material that will not pull apart, as with an ordinary split-ring washer.

In the drawings, Figure 1 is a detail perspective view of a piece of wire in the act of being cut into sections of appropriate length. Fig. 2 is a detail perspective view of a section of wire from which a washer is to be formed. Fig. 3 is a detail perspective view of a section of wire in the act of being formed into a ring. Fig. 4 is a similar view, but showing the ends of the wire brought together and ready to be compressed. Fig. 5 is a diagrammatic view of a pair of plungers compressing a ring into a flat washer. Fig. 6 is a detail perspective view of a complete washer. Fig. 7 is a detail view showing a different form of locking means on the ends of a length of wire. Fig.

8 is a similar view of a further modification of the same.

The numeral 1 represents a piece of preferably round wire, and 2 a section of the same, from which washers are to be formed.

3 represents a conventional cutting-tool for severing the wire, and it has formed on its lower edge a V-shaped cutter, which correspondingly cuts the ends of the wire, forming in one end a V-shaped tongue 5 and at the opposite end a seat 6. The section of wire 2 is now formed into a ring, the tongue 5 registering with the seat 6, this operation being formed by any suitable means and in any obvious manner. However, I prefer to form the ring on a die 7, after which the appropriate actuating mechanism is operated and the dies are brought together and compresses the ring into a flat washer. In this connection I desire to emphasize the fact that the outer working diameters of the dies equal the outer diameter of the ring, while the projection 9 is equal the inner diameter of said ring. This construction increases the density of the metal, and yet the predetermined and original diameter of the ring is maintained. After the ring is compressed by the dies the latter are separated and the washer is removed.

Although technically a split-ring washer is formed, the essential characteristic of an endless washer is present and at the same time possesses the advantages incident to one manufactured from sheet metal. The dies when brought together compress the molecules of metal with such pressure as to increase the density, and thus add considerable strength to the article. Inasmuch as the diameter of the completed washer is equal to the original diameter of the ring from which it was formed and as the thickness of the wire forming the ring has been materially decreased in thickness, obviously the molecules of metal in the tongue 5 and seat 6 will be so clenched into each other that the line of division of the metal will practically be invisible. Indeed, the compression of the metal at the joint is such as to cause the molecules thereof to be forced together as to make it practically impossible to separate the ends without mutilating the

edges. The compression of the tongue in its seat forms a lock-joint.

In the modification shown in Figs. 7 and 8 the tongue 15 is provided with lateral projections 16, the opposite end of the section of wire having a seat 17 corresponding to the shape of the tongue 15, so that when the two ends are brought together they are locked, and when the final compression of the metal takes place a washer is formed which cannot be separated.

The essential feature of my invention resides in the art of forming a ring washer from a section of metal, as well as the article thus made, the ends of the metal being so arranged and acted upon that they are merged into each other as to render a line of demarcation impossible.

What I claim as new is—

The art of making ring washers from sections of metal, which consists of cutting the metal into a desired section and forming in one end a seat and in its opposite end a tongue, then coiling the section of metal into a ring, the tongue being in its seat, and finally compressing the ring into a flat washer and simultaneously destroying the smooth faces of the tongue and seat and causing them to clench together and lock the ends, substantially as described.

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

HUBERT CHAUNCEY HART.

Witnesses:

GEORGE E. TAFT,

JNO. IMIRIE.