

UNITED STATES PATENT OFFICE.

HUBERT C. HART, OF UNIONVILLE, CONNECTICUT.

MACHINE FOR MAKING WASHERS.

No. 887,630.

Specification of Letters Patent.

Patented May 12, 1908.

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To all whom it may concern:

Be it known that I, HUBERT C. HART, a citizen of the United States, residing at Unionville, in the county of Hartford and State of Connecticut, have invented new and useful Improvements in Machines for Making Washers, of which the following is a specification.

This invention relates to improvements in machines for making lock washers, from bar metal.

The object of the invention is to provide, mechanism for coiling a bar of metal around a mandrel; mechanism for withdrawing the mandrel; and mechanism confining and compressing the coil between a pair of dies, formed with offsets to displace and separate the ends of the adjacent ends of the coil.

A further object of the invention is to provide means for forming a rib on one face of the washer, when the dies are brought toward each other.

Cup-shaped receptacles have been previously used to form a compression chamber for the coil, but I have found from practical experience that the constant pounding of the die against the inside of the chamber tends to wear the surface. This causes delay in adjusting, and incidentally unnecessary expense. In my present improvement I overcome this difficulty by placing a disk with an opening of the diameter of the proposed washer, and form the bottom of the chamber with one of the dies.

In the drawings: Figure 1, is a vertical section showing the parts in position before a ring is formed and compressed. Fig. 2, is a similar view, the ring being flattened. Fig. 3, is a perspective view, parts separated to show the faces of the plunger and mandrel. Fig. 4, is a section on the line X—X, Fig. 1. Fig. 5, is a perspective view showing the mandrel and plunger coincident. Fig. 6, is a detail view of a washer formed by my improved machine.

1, indicates a mandrel; 2, a plunger; 3, an anvil; and 4 a collar or housing in which the washer is formed.

The operative face of the anvil is of spiral formation, to form a depression 6, and a projection 7, to form one face of a washer. The face of the plunger is of spiral formation, corresponding to the shape of the face of the anvil. The depression 8, of the plunger face is opposite the projection 7, of the anvil, while projection 9, of said plunger face is op-

posite the depression 6, of the anvil. In other words the spiral faces of the anvil and the plunger are constructed so as to register when brought together.

The face 10, of the mandrel is spirally formed coincident with the formation of the plunger face, and is beveled to an edge for a purpose to be described.

The housing 4, which confines the washer while being compressed is in the form of a collar, positioned in a seat 15, in the frame. I have found by practice that by reason of the constant pounding of the plunger, and anvil, the washer seat becomes worn, and in order that it may be quickly and conveniently taken out, and another replaced to maintain the size of a standard washer, it is essential that a detachable housing be provided, and when the space between the faces of the mandrel and anvil become reduced, the anvil may be adjusted.

In operation wire or the like metal is fed over the mandrel and severed, the upper side of the coiling mechanism bends it into U-shape when the reciprocating lower coiling means 25, completes the ring, then the plunger 2, slides on the mandrel 1, and forces the ring into the housing and against the anvil and flattens the metal. The movement of the mandrel is such that when the plunger catches up to its face the two elements will move in toward the anvil, and the beveled edge 10^a will form a rib on one face of the washer. By bringing the faces of the plunger and the anvil toward each other, the ring is flattened and its ends displaced, forming a flat split lock washer as shown in Fig. 6.

After the washer is formed, the anvil is moved outwardly, and the completed article is ejected.

The diameter of the plunger and that of the opening in the housing, is of such shape that the former fits into the latter to produce a washer of predetermined size.

With the parts arranged as described, I am enabled to produce a lock washer from wire or bar metal, in a cheap, quick and convenient manner.

Because of the numerous patents issued, showing various means for operating the parts shown and described, I have not deemed it necessary to show and describe in detail such mechanism.

What I claim is:

1. In a washer-forming machine, a mandrel, means for forming a ring about the

mandrel, an anvil formed with a spiral face, said anvil being in line with the mandrel, a plunger slidably mounted on the mandrel and having a face cooperating with the anvil, means for moving the plunger on the mandrel toward the anvil and means for moving the mandrel when the face of the plunger reaches the face of said mandrel, the plunger and mandrel moving together to compress the ring against the anvil.

2. In a washer-forming machine, a mandrel, means for forming a ring about the mandrel, an anvil formed with a spiral face in alinement with the mandrel, a plunger formed with a cooperating spiral face, said plunger being in alinement with the anvil, means for moving the plunger face toward the face of the mandrel, and means for subsequently advancing said mandrel and plunger together toward the anvil to compress the ring thereagainst.

3. In a washer-forming machine, a mandrel, means for forming a ring about the mandrel, an anvil formed with a spiral face in alinement with the mandrel, a plunger formed with a cooperating spiral face in alinement with the face of the anvil, means for moving the plunger toward the face of the mandrel, and means for subsequently advancing said mandrel and plunger together toward the anvil to compress the ring thereagainst, the face of the mandrel being beveled to form a rib on the completed article.

4. In a washer-forming machine, a frame formed with a depression, a housing removably seated in the depression, an anvil fitting

an opening in the depression, a mandrel in alinement with the anvil, means for forming a ring about the mandrel, a plunger surrounding the mandrel, and means to operate the plunger to force the ring from the mandrel and into the opening in the housing and against the anvil.

5. In a washer-forming machine, a frame formed with a depression, a housing removably seated in the depression, an anvil fitting an opening in the depression, a mandrel in alinement with the anvil, means adjacent the mandrel for forming a ring about the mandrel, a plunger surrounding the mandrel, and means to operate the plunger to force the ring from the mandrel and into the opening in the housing and against the anvil, the respective cooperative face of the plunger and anvil being spirally formed in relatively reverse directions, whereby to offset the ends of the ring.

6. In a washer-making machine, the combination with a mandrel having a spiral beveled face, means for forming a ring on the mandrel, a plunger having a spiral face, an anvil having a spiral face to cooperate with the face on the plunger, and means for moving the plunger and mandrel after initial formation of the ring into cooperation with the anvil to compress the ring to conform to the respective spiral faces.

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

HUBERT C. HART.

Witnesses:

JNO. IMIRIE,

A. H. BENNETT.