No. 777,436. PATENTED DEC. 13, 1904.

A. SANG.

METHOD OF MAKING WASHERS.

APPLICATION FILED JULY 9, 1903.

NO MODEL.

Fig. 1.

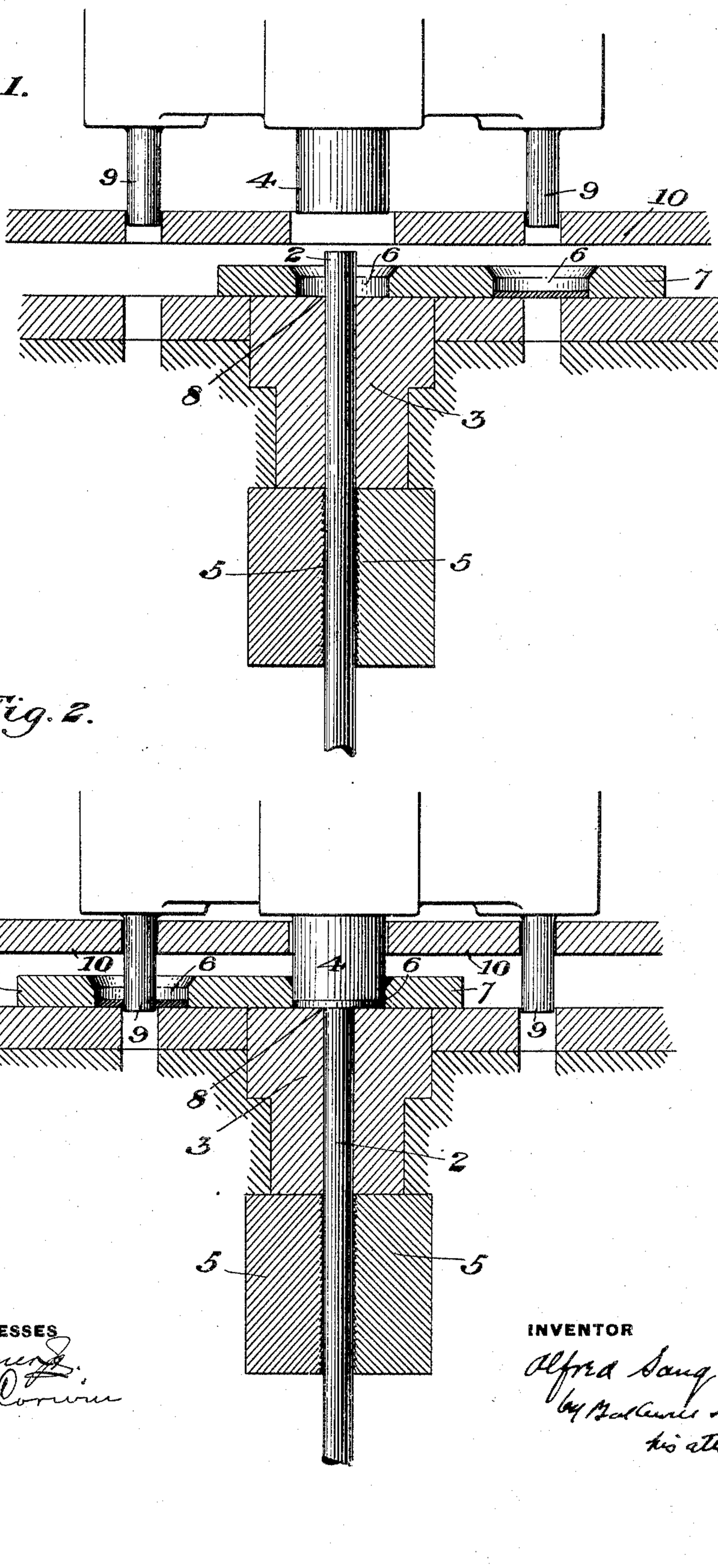

Fig. 2.

WITNESSES

INVENTOR

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by Baldwin Bynes

his attys

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UNITED STATES PATENT OFFICE.

ALFRED SANG, OF SEWICKLEY, PENNSYLVANIA, ASSIGNOR TO GARLAND NUT & RIVET COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

METHOD OF MAKING WASHERS.

SPECIFICATION forming part of Letters Patent No. 777,436, dated December 13, 1904.

Application filed July 9, 1903. Serial No. 164,812. (No model.)

To all whom it may concern:

Be it known that I, ALFRED SANG, of Sewickley, Allegheny county, Pennsylvania, have invented a new and useful Method of Making Washers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 shows the dies and rod in position to upset the rod to form a head and a blank in position to be punched, and Fig. 2 is a similar view after upsetting and punching operations have taken place.

My invention is designed to provide a simple and rapid method for making washers or other annular disks of metal. It enables me to make such articles continuously and rapidly and to make them of superior quality.

My invention consists in manufacturing the annular washer or like article by upsetting the end of a rod into disk form and then severing it from the rod and punching out the metal at its center.

In the drawings, in which I show dies suitable for the practice of my invention, 2 represents the rod, which may be of iron, steel, or any other metal, and 3 is a hollow die of about the diameter of the block through which it passes and against which the end of the rod is upset.

4 is the upsetting-die, which is actuated by a suitable plunger and is adapted to upset the end of the rod which projects beyond the end of the die 3.

5 5 are gripping-dies on which the rod is held during the upsetting operation.

The upset end of the rod fills one of the openings 6 in a sliding holder 7, which is preferably provided with two openings 6, which are used alternately to receive the upset portion of the rod and to shear it off from the rod as the holder 7 is moved across the face of the die 3, which constitutes a stationary shear-blade. The holder carries the sheared washer-blank into position in line with a punch 9, by which the center of the washer-blank is perforated to form a finished washer, which is stripped from the punch by a suitable stripper 10 as the punch recedes. In the drawings I have shown two punches on opposite sides of the upsetting-die. The upsetting and punching operations are preferably carried on simultaneously, and the punches act upon the sheared blank, which is delivered by the holder first to one of said punches and then to the other at the next upsetting operation.

The operation is as follows: The rod 2 is advanced through the die 3, so that a portion of it projects beyond the die, affording sufficient stock for the annular washer. The gripping-dies hold the rod during the upsetting operation. The heading-die advances and upsets the end of the rod. The upset portion of the rod is preferably confined within an opening of the size and shape of the washer, and the heading-die preferably fits within this opening in the holder. The holder 7 is moved across the face of the die 3, and the washer-blank formed by upsetting the metal is sheared off. The holder is moved so as to bring one of the empty openings in the holder in line with the upsetting-die and the gripping-jaws 5 5 are released. A fresh length sufficient when upset to form a washer is fed forward. The gripping-jaws are then clamped upon the rod. The upsetting-die is advanced, and with it preferably the punching-dies, one of which simultaneously with the upsetting operation passes through the washer-blank and forms the finished washer. The punch and upsetting-die are then retracted and the annular washers slip therefrom. Another length of the rod is fed through the die 3, and the operation proceeds as above described. By thus forming an upset disk on the end of the rod and shearing the metal at the connection of the rods with the disk all portions of the metal which have been especially weakened by the upsetting operation—namely, the metal at the juncture between the rod and the disk—makes such shearing easy, and as this portion is punched out in finishing the washer a very strong and serviceable washer is formed.

The construction of the dies and the means

for actuating them may be varied in many ways without departure from my invention, since

What I claim is—

The method of making annular metal articles, consisting in feeding a rod forwardly through an embracing member, upsetting its projecting end within a die-cavity, moving the die sidewise to sever the upset portion from the rod, and then punching the upset blank; substantially as described.

In testimony whereof I have hereunto set my hand.

ALFRED SANG.

Witnesses:
F. C. HODKINSON,
A. McD. TAYLOR, Jr.