(No Model.)

F. R. STAFFORD.

APPARATUS FOR MANUFACTURING FINGER RINGS.

No. 533,182. Patented Jan. 29, 1895.

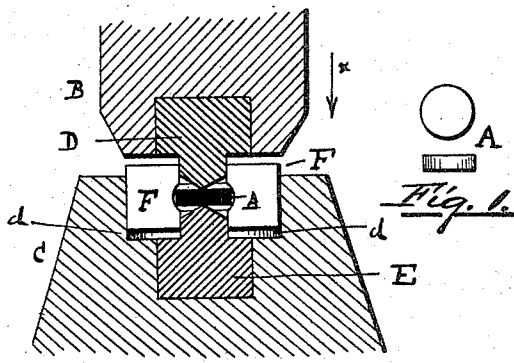

Fig. 2.

Fig. 1.

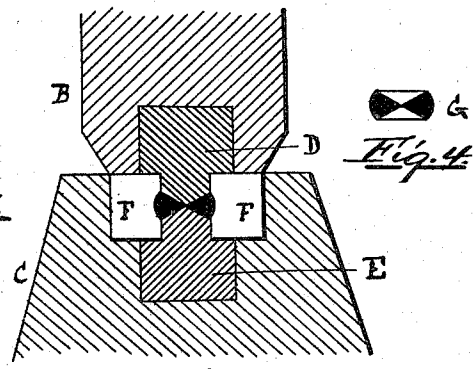

Fig. 3.

Fig. 4.

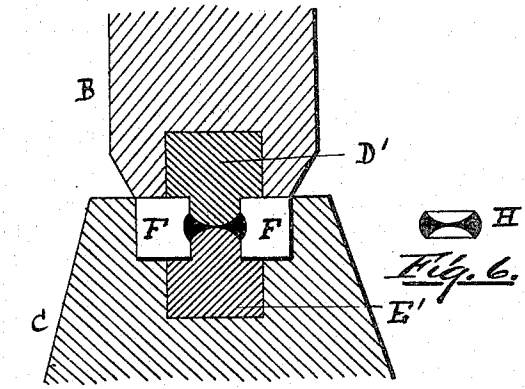

Fig. 5.

Fig. 6.

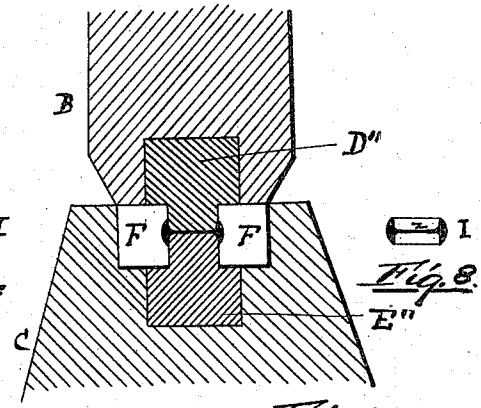

Fig. 7.

Fig. 8.

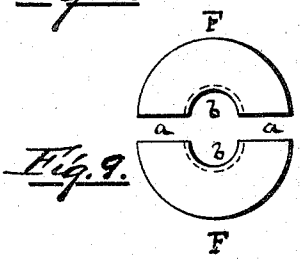

Fig. 9.

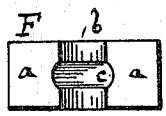

Fig. 10.

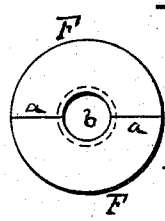

Fig. 11.

Fig. 12.

Fig. 13.

Witnesses

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UNITED STATES PATENT OFFICE.

FRANK R. STAFFORD, OF PROVIDENCE, RHODE ISLAND.

APPARATUS FOR MANUFACTURING FINGER-RINGS.

SPECIFICATION forming part of Letters Patent No. 533,182, dated January 29, 1895.

Application filed July 27, 1894. Serial No. 518,708. (No model.)

To all whom it may concern:

Be it known that I, FRANK R. STAFFORD, of the city and county of Providence, in the State of Rhode Island, have invented a certain new and useful Improvement in Apparatus for Manufacturing Finger-Rings; and I declare the following to be a specification thereof, reference being had to the accompanying drawings.

Like letters indicate like parts.

Figure 1 is a top plan and side elevation of the metallic blank, from which the ring is to be made. Fig. 2 shows in diametrical vertical section the dies, die-block, plunger and said blank, and in side elevation, one of the collars, within which the blank is contained. In this figure the parts are in position for the first operation. Fig. 3 shows the same parts in like section and elevation, but at the end of the first operation. Fig. 4 is a diametrical section of the stock after the first operation. Fig. 5 shows the second operation and the shape of the dies for accomplishing the same. Fig. 6 shows the product of the second operation. Fig. 7 shows the third operation and the shape of the dies for accomplishing the same. Fig. 8 shows the product of the third operation. Fig. 9 is a top plan of the two collars for shaping the exterior surface and edges of the ring. Fig. 10 is a side elevation of one of said collars, as seen on the interior surface thereof. Fig. 11 is a top plan showing the two collars in operative contact. Figs. 12 and 13 are a top plan and diametrical section of the finished ring.

My invention relates to the manufacture of solid (seamless and unsoldered) rings of gold or other homogeneous metal, and consists in the use of a collar in two parts, having a matrix or groove to give shape to the exterior surface and edges of the ring, and dies of peculiar shapes, mounted respectively in a plunger and die-block, and adapted to successively indent and push outwardly the central portion of a disk or blank of gold, or other metal, into said matrix or groove, until only a mere diaphragm of metal is left in the center of the blank, so treated, which is removed by burring, and burnishing down the interior surface of the ring, as hereinafter particularly specified.

The gold or other metallic disk or blank is shown at A in Fig. 1 in top plan and side elevation. I use in my improved process of ring-manufacture a plunger B and a die-block C, in which, respectively, are mounted centrally the dies D and E.

The dies D E each have a central cylindrical projection terminating in a conical point. I use also a collar F, made in two parts, having the plane faces *a* and a semi-tubular opening *b*, which, when the two parts of the collar are placed in contact on their plane faces *a*, as shown in Fig. 11, constitute a central tubular bore.

At right angles to the axis of this bore is an annular groove or matrix *c*, made of such shape as is desired to fashion the exterior surface and edges of the ring.

The parts are at first put in the position shown in Fig. 2, in which it is seen that the blank A is within the groove *c* of the collar F, which, however, it does not fill, and between the points of the conically-shaped dies D E. The collar F does not now fill the central socket *d* of the die-block C, because of the interposition of the blank A between the dies D E. Power, applied to the plunger B in the direction indicated by the arrow *x*, causes the points of the dies D E to penetrate the central portions of the blank A on both sides thereof, until said points almost meet, when the plunger has traveled the full extent of its stroke and the collar is forced to the bottom of the socket *d*. The conical or tapering sides of the dies D E cause the metal of the blank to spread radially, until the edges of the blank are thickened or swaged and conform to and fill the groove *c* of the collar F. The result of this operation is shown in diametrical section at G, in Fig. 4, and consists, as there seen, of a metallic body, having parallel top and bottom, circular edges, a convex circumference and two central conical indentations.

In the second operation, illustrated in Fig. 5, I use the same grooved collar F, with the plunger and die-block, as before; but the

dies D′ E′ each have now a convex end. The piece G, which was the product of the first operation, is placed between the dies D′ E′, and when the plunger has acted to still further spread or swage the metal radially, the result is as shown at H, in Fig. 6, in diametrical section.

The third operation, illustrated in Fig. 7, is similar, except that the dies D″ E″ have practically square ends, with slightly rounded edges. The piece H is subjected to this operation and the result is shown in diametrical section at I in Fig. 8, in which it is seen that only a thin partition or diaphragm *z* of metal now remains, slightly thickened at its line of contact with the walls of the ring. This diaphragm *z* is now burred out in the usual manner and the interior of the ring, so formed, is burnished down and the finished ring is seen in top plan and diametrical section in Figs. 12 and 13.

If desired, the groove *c* of the collar F may have any design, ornamentation or figures, engraved, sunk or raised therein, to give a corresponding ornamentation to the exterior surface of the ring. The swaging or spreading of the blank under the pressure of the plunger forces the metal into the exact shape, configuration and design of the annular groove or matrix *c* of the collar F.

It is also obvious that the groove *c* may be made rectangular in section or of any other desired shape.

I claim as a novel and useful invention and desire to secure by Letters Patent—

1. A device of the class described comprising a die-block, a die therein, a collar surrounding said die and divided diametrically into a plurality of parts, a plunger adjacent the die block and a second die in said plunger adapted to enter the said collar and into opposition to the die in the block.

2. A device of the class described comprising a die-block adapted to receive a removable die, a collar surrounding said die movable longitudinally thereof and divided diametrically into a plurality of parts, a plunger adjacent the die block, and a die removably arranged in the plunger to be depressed into the collar and into opposition to the die in the block.

3. A device of the class described comprising a die block, a die therein, a collar surrounding said die and movable longitudinally thereof and adapted to receive and retain the stock to be operated upon, a plunger adjacent the die-block and a second die in the plunger adapted to enter said collar and into opposition to the die in the block.

4. A device of the class described comprising a die block, a die therein, a collar surrounding said die and divided diametrically into a plurality of parts and movable longitudinally of the die, a plunger adjacent the die block, and a second die in the plunger adapted to enter said collar and into opposition to the die in the block.

5. A device of the class described, comprising a die-block having a die therein, a separable collar surrounding said die, a plunger adjacent the die-block, and a second die in said plunger adapted to enter the said collar and into opposition with the die in the block.

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