No. 685,653. Patented Oct. 29, 1901.

F. R. STAFFORD.

FINGER RING.

(Application filed Dec. 19, 1900.)

(No Model.)

FIG. 1.

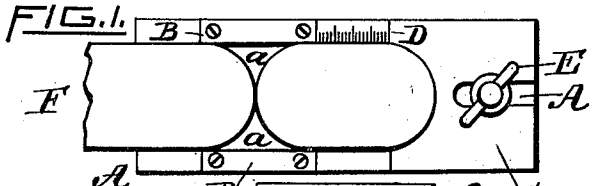


FIG. 3.

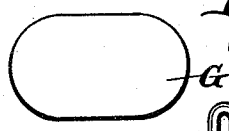


FIG. 2.

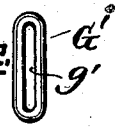


FIG. 6.

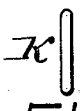


FIG. 8.

FIG. 7.

FIG. 9.

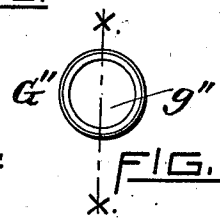


FIG. 10.

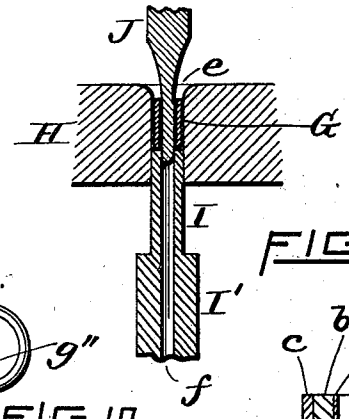


FIG. 4.

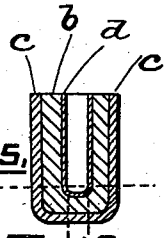
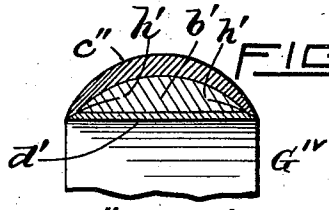


FIG. 5.

FIG. 14.



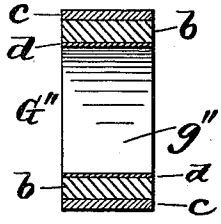


FIG. 11.

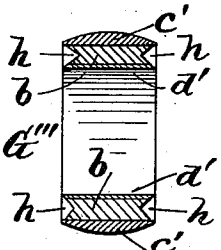


FIG. 12.

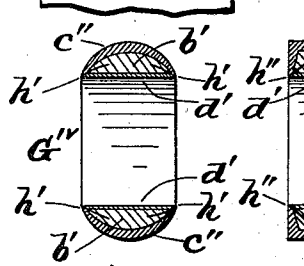


FIG. 13.

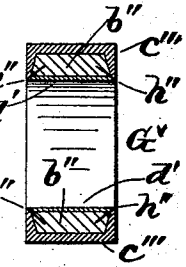


FIG. 15.

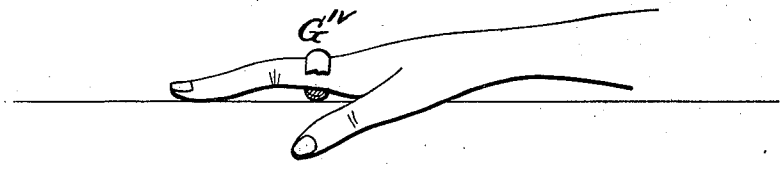


FIG. 16.

WITNESSES.

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Joseph R. Bullock Jr

INVENTOR.

Frank R. Stafford

By Warren R. Pierce

Atty.

UNITED STATES PATENT OFFICE.

FRANK R. STAFFORD, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO STAFFORD & RUSSELL MANUFACTURING COMPANY, OF SACO, MAINE, A CORPORATION OF MAINE.

FINGER-RING.

SPECIFICATION forming part of Letters Patent No. 685,653, dated October 29, 1901.

Application filed December 19, 1900. Serial No. 40,434. (No model.)

To all whom it may concern:

Be it known that I, FRANK R. STAFFORD, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Finger-Rings, of which the following is a specification, reference being had therein to the accompanying drawings.

Like letters indicate like parts.

Figure 1 is a top plan view of the tool for gaging the stock for the ring-blank and for holding the same while it is cut by a suitable plunger into the desired lengths. Fig. 2 is a top plan view of one of the ring-blanks from which my improved filled ring is made. Fig. 3 is an edge or side view of the same. Fig. 4 is a view in vertical section of the draw-plate and plungers, together with the stock therein undergoing the drawing operation. Fig. 5 shows an enlarged central longitudinal section (on the minor axis) of the cupped-up ring-blank produced by the operation illustrated in Fig. 4 at a time just before the bottom portion thereof has been perforated. Fig. 6 is a top plan view of the blank after it has been drawn and perforated by the operation illustrated in Fig. 4. Fig. 7 is an end view of the same. Fig. 8 is a top plan view of the central piece which has been removed from the ring-blank by the drawing and perforating operation illustrated in Fig. 4. Fig. 9 is an end view of the same. Fig. 10 is a top plan view of the drawn and perforated blank shown in Fig. 6 after it has been opened out by a proper tool into the form of a ring. Fig. 11 is a view of said ring as seen on line *x x* of Fig 10. Fig. 12 shows in diametrical section the blank illustrated in Fig. 6 after the same has been circumferentially grooved near its ends and the outer surface has been convexed. Fig. 13 is a diametrical sectional view of the grooved and convexed ring shown in Fig. 12 after the sides of the grooves have been swaged into contact. Fig. 14 is an enlarged sectional view illustrating the closure of the groove. Fig. 15 is a diametrical sectional view of a flat ring formed by die action from the convex ring illustrated in Figs. 13 and 14. Fig. 16 shows my improved ring, partly in elevation and partly in section, in position upon a finger.

In the drawings, Figs. 5, 11, 12, 13, and 15 are much enlarged in order to show more clearly the construction of my improved ring, and Fig. 14 is even more enlarged for the same purpose.

My invention is an improvement in finger-rings of the kind commercially known as "filled" rings—that is, rings which are made of gold-plated stock, the body of the rings being made of composition or base metal and having all its exposed surfaces of gold. My improved ring is not only a filled ring, but it is made without any transverse seam, whereas filled rings as heretofore commonly made have been formed of stock in the form of a band or strip having two opposite ends, which are butted together and united by solder.

My invention relates to a jointless filled ring whose outer plate or covering of gold is transversely stretched, so that the annular edges of said outer plate or covering come into contact with the adjacent annular edges of the inner plate or covering of gold, as hereinafter particularly described and as specifically set forth in the claims.

In the drawings, A is a steel bar on the edges of which, on the top, are two guide-plates B B, held in place by screws, as shown.

C is a gage-plate having a slot at one end and a half-round seat at the other end. The gage-plate C is mounted upon the top of the bar A and is movable thereon, so that the end which has the half-round seat can be brought to any line of the index D, (on the top of said bar,) and when the gage-plate C has been so adjusted in position it is held in place by means of the thumb-screw E, which passes through said slot of the gage-plate C into the bar A, all as shown in Fig. 1.

The stock from which my improved ring is made is in the form of a bar F, having a central longitudinal layer of composition or base metal with an outer layer or plate of gold on two opposite sides of said central layer and united thereto, as usual, by solder, one of said gold plates being thicker than the other.

The stock has a half-round forward end, as seen in top plan in Fig. 1, and is inserted be-

tween the guide-plates B B and pushed along upon the bar A until said half-round forward end is seated in the concavity of the gage-plate C. To determine the precise length of the blank or section to be cut from said strip of stock, the inner edge of the gage-plate C is moved to the proper point on the index D and is held in such position by the thumb-screw E. A plunger (not shown) descends with power vertically upon said strip of stock and cuts off a ring-blank G, forming the inner end of the blank G in a half-round shape and at the same time forming the forward end of the strip of stock in a half-round shape, as illustrated in Fig. 1, the openings *a a* in said figure indicating where the said plunger has operated and removed portions of said stock. The ring-blank so formed and cut off is shown in top plan in Fig. 2 and in side elevation in Fig. 3, in the latter of which the blank is seen to be made up of a central strip or layer *b* of base metal or composition, the upper layer *c* of gold plate, and the lower layer *d* of gold plate, thinner, however, than the plate *c*. This blank G is next operated upon as illustrated in Fig. 4. A draw-plate H has an aperture *e* through it with an upwardly-flaring mouth. This aperture as seen from above has a narrow oblong shape, with rounded ends. The ring-blank G is laid centrally upon the draw-plate H, with the thin gold plate *d* uppermost, the major axis of said oblong blank coinciding with the major axis of said aperture and the minor axis of said blank coinciding with the minor axis of said aperture. A plunger J, moved by power, descends upon the blank G and crowds it down into the aperture *e* of the draw-plate H until the blank G is sufficiently cupped and drawn thereby and until its bent bottom portion is seated upon the end of the plunger I. The plunger I has its lower end I′ concentrically enlarged, and the lower extremity of said end I′ is firmly held against downward movement or displacement by any suitable means. The plunger I and its end I′ are centrally, longitudinally, and continuously perforated, as seen at *f*, Fig. 4, the shape and size of said perforations being such as shown in Fig. 8. The plunger I is of a shape and size to loosely fit in the aperture *e* of the draw-plate H. Then continuing descent and pressure of the plunger J perforates the bottom of the cupped blank G, removing a piece, (shown at K in Figs. 8 and 9,) which removed piece K so perforated or punched out is forced down into the opening *f* of the plunger I I′ and is waste, gradually moved along by the succeeding operations and passing through said opening *f* to the floor or into a proper receptacle. The plunger I I′ is then moved upward and its upper end forces the drawn blank out through the flaring mouth of the aperture *e* of the draw-plate H.

The vertical dotted lines in Fig. 5 indicate the portion of the cupped blank which is removed, constituting the piece K of Figs. 8 and 9. The horizontal dotted line in said figure indicates where said cupped and perforated blank is cut transversely by a saw or other proper tool or instrument. Said Fig. 5 is made on an enlarged scale in order more plainly to show the cupping and drawing effect upon the blank caused by the operation illustrated in Fig. 4 and how the bottom of the cup is disposed of. The punched or perforated blank so produced is shown at G′ in Figs. 6 and 7, where it is seen that said blank is oblong in shape, with rounded ends and with a narrow oblong opening *g′*, said opening being caused by the removal of the piece K from the blank G, as already explained. The next operation is to open said oblong aperture by a mandrel or other suitable means into the circular-ring form G″, with the central circular aperture *g″*, as seen in Fig. 10.

In Fig. 11 I show on an enlarged scale the ring after it has been shaped into a true circle, said Fig. 11 being a sectional view on line *x x* of Fig. 10. Here is seen the base-metal central portion *b*, the outer thick layer or covering of gold plate *c*, and the inner thin layer or covering of gold plate *d*. The next operation is to form from the ring G″ the ring G‴. (Shown in Fig. 12.) It will be here seen that the outer covering or plate *c* of gold has been somewhat convexed, as shown at *c′*. This is done by turning or any other suitable means. It is also seen that a circumferential V-shaped groove has been formed (by milling or otherwise) in the edges of the base metal *b*, as shown at *h*, and that the edges of the gold plate *d* have been beveled. The next operation is to form from the ring G‴ the ring G^{iv}. (Shown in Fig. 13.) It will be here seen that the sides of the V-shaped circumferential grooves *h* have been brought into contact, so that said sides of said grooves meet in a line *h′*, the filling of base metal concaved, as seen at *b′*, and the gold plate *c′* is transversely stretched and still further convexed, as seen at *c″*. The operations illustrated by Figs. 12, 13, and 14 are preferably performed by rolling or may be done by swaging, burnishing, or other suitable methods well known for this kind of work.

As is apparent from an inspection of Fig. 11, the outer gold plate *c* is of the same width as the inner gold plate *d*. By the rolling operation, whose result is shown in Fig. 13, it is seen that while the inner tubular gold plate *d′* remains of the same width as before the outer gold plate *c″*, though originally of the same width as the inner gold plate *d*, measures much more on its periphery transversely, having been made concavo-convex in cross-section. This is due to a transverse stretching of the outer gold plate, caused by the action of the rolls and resulting in the meeting of the annular edge of said outer gold plate with the annular edge of said inner gold plate. Such transverse stretching of the outer gold

plate to meet the inner gold plate I believe is a novelty in the art of manufacturing filled rings.

If it is desired to have a flat ring instead of a convexed ring, such as is shown in Figs. 13 and 14, I take the ring G^{iv} shown in said figures, and by swaging, rolling, or other suitable treatment force the ring G^{iv} into the form G^{v} shown in Fig. 15, where it is seen that the gold plate c'' of the ring G^{iv} has been shaped with square corners and the filling of base metal has been changed to a corresponding shape b'', the closure of the sides of the grooves h together being indicated by the lines h''. It is obvious, however, that the foregoing method of manufacturing rings is applicable to rings of solid metal—as gold, silver, and other metals—or that rings may be cut from stock which is tubular in shape and which is either solid or made with outer and inner coverings of gold.

The rolling or swaging operation whereby the grooves h of the ring are closed as above specified brings the beveled edges of the gold plate c'' into absolute contact with the beveled edges of the gold plate d, forming only a mere line on the upper and lower edges of the ring, which by burnishing down becomes invisible and all the base metal is wholly concealed.

By this method of manufacturing rings the amount of waste is reduced to a minimum, the outer plate of gold is graduated in thickness, and the cost of the manufacture is much smaller than that of other methods.

The essential novelty of this invention is the forming of the stock with an annular V-shaped groove and rolling or swaging said stock, so that the sides of said groove meet. It is obvious that this grooving may be made by drawing the stock in the form of a strip or wire through a draw-plate with a suitably-shaped aperture, and after the sides of the groove have been closed together by swaging or other suitable treatment the stock, still being in the form of a strip or wire, (half-round or of other desirable form in cross-section,) can be cut in lengths, bent into a ring, and its ends soldered together and finished in the usual manner; but such or similar modifications would be within my invention.

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

1. The improved jointless ring herein described, having a central portion of base metal, plano-convex in cross-section, an inner tubular gold plate united to said base-metal portion on the plane side thereof and a separate outer gold plate united to said base metal on the convex side thereof and crescent-shaped in cross-section, the edges of the outer gold plate meeting the edges of the inner gold plate and constituting the edges of the finished ring, substantially as specified.

2. The improved jointless ring herein described, having a central portion of base metal, plano-convex in cross-section, an inner tubular gold plate united to said base-metal portion on the plane side thereof and having beveled edges, and a separate outer gold plate united to said base metal on the convex side thereof and crescent-shaped in cross-section, the edges of the outer gold plate meeting the beveled edges of the inner gold plate and constituting the edges of the finished ring, substantially as specified.

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

FRANK R. STAFFORD.

Witnesses:

ARTHUR P. JOHNSON,

WARREN R. PERCE.