

No. 651,533.

Patented June 12, 1900.

C. A. RUSSELL & E. S. GODDARD, JR.
PROCESS OF MAKING GOLD FILLED JEWELRY.

(No Model.)

(Application filed Jan. 19, 1900.)

3 Sheets—Sheet 1.

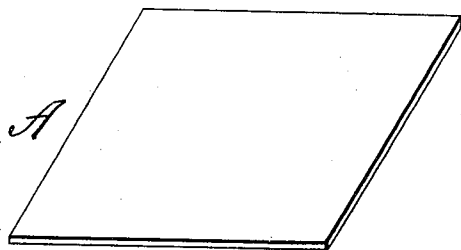


FIG. 1.

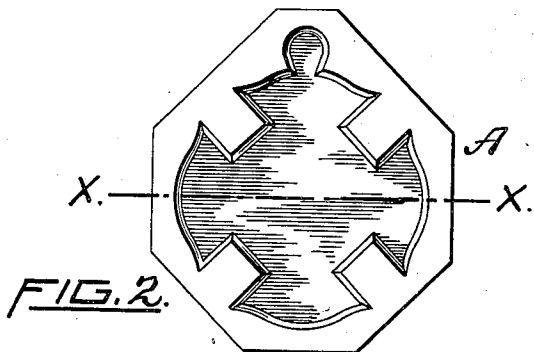


FIG. 2.

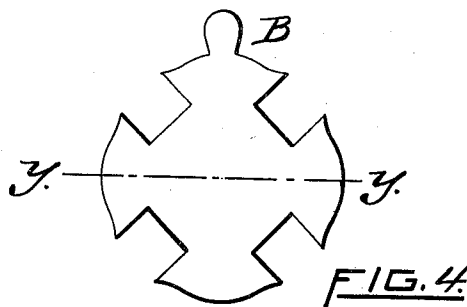


FIG. 4.

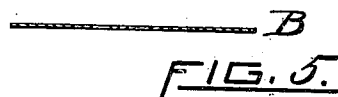


FIG. 5.



FIG. 3.

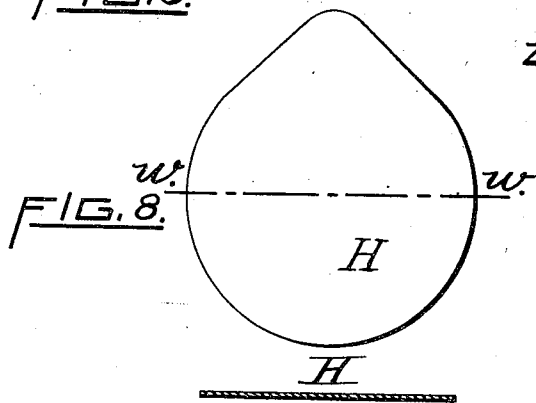


FIG. 8.

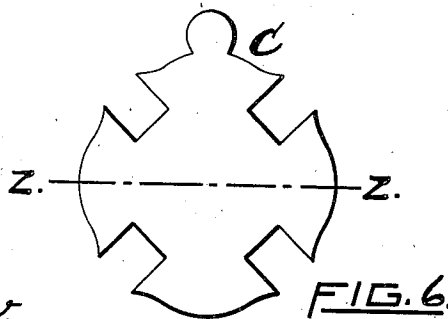


FIG. 6.



FIG. 7.

FIG. 9.

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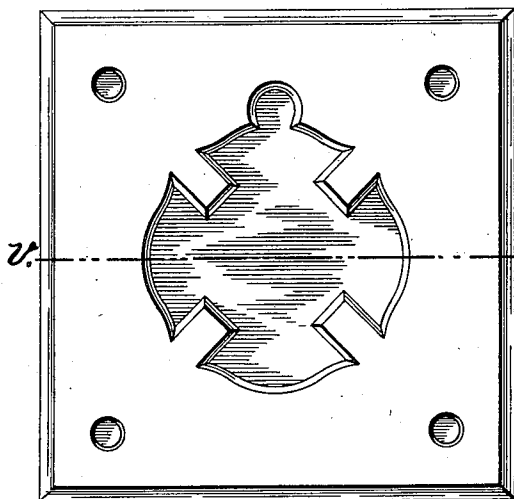
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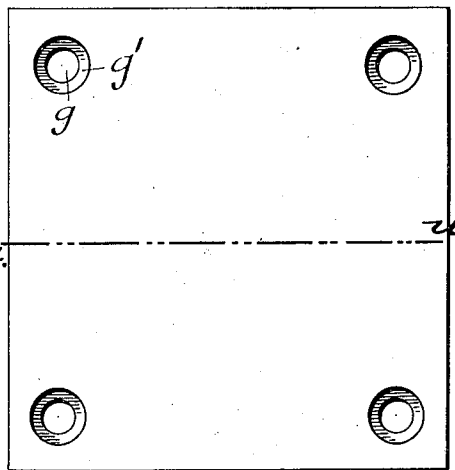
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F FIG. 10.



G FIG. 12.

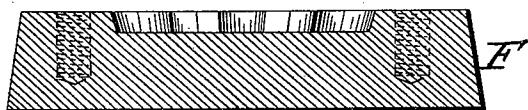


FIG. 11.



G FIG. 13.

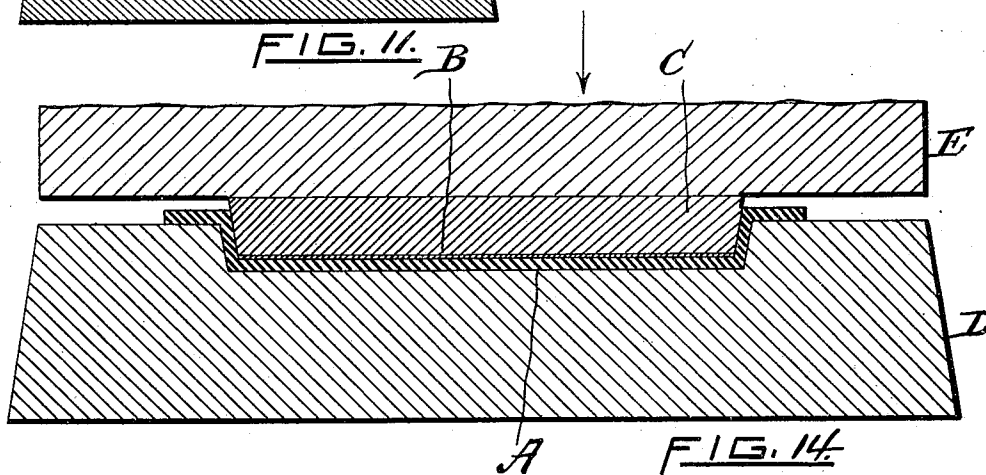


FIG. 14.

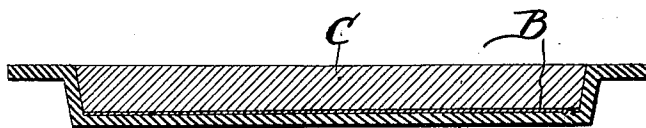


FIG. 15.

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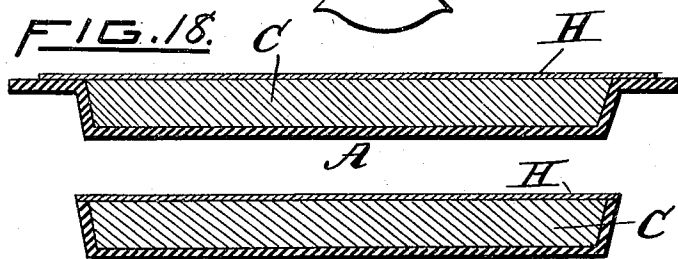
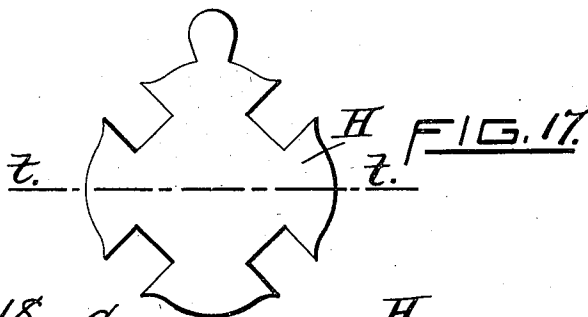
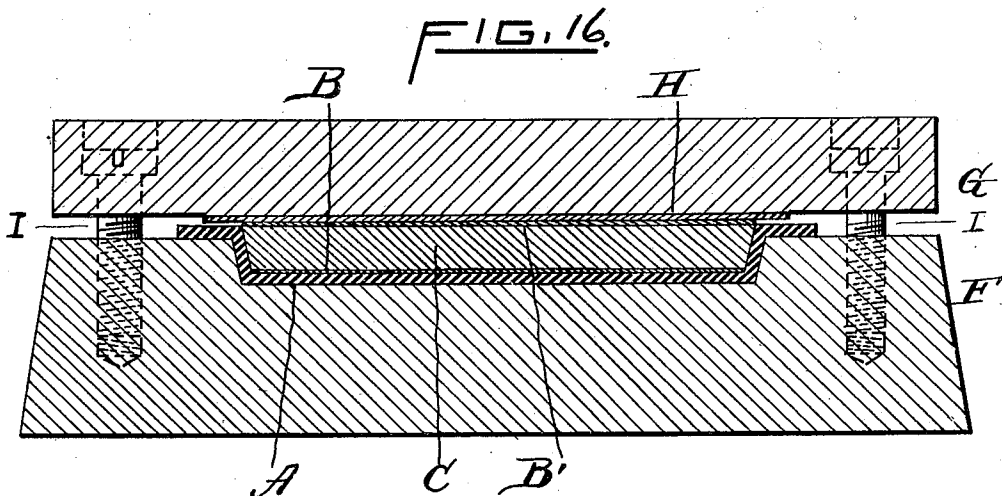
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UNITED STATES PATENT OFFICE.

CHARLES A. RUSSELL AND EDWARD S. GODDARD, JR., OF PROVIDENCE,
RHODE ISLAND, ASSIGNORS TO CHARLES F. IRONS AND CHARLES A.
RUSSELL, OF SAME PLACE.

PROCESS OF MAKING GOLD-FILLED JEWELRY.

SPECIFICATION forming part of Letters Patent No. 651,533, dated June 12, 1900.

Application filed January 19, 1900. Serial No. 2,059. (No specimens.)

To all whom it may concern:

Be it known that we, CHARLES A. RUSSELL and EDWARD S. GODDARD, Jr., citizens 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 Processes of Manufacturing Gold-Filled Jewelry, of which the following is a specification, reference being had therein to the accompanying drawings.

Like letters indicate like parts.

Figure 1 is a perspective view of the blank of gold-stock which is to be operated upon by our improved process to constitute the bottom and side coverings or shell of a gold-filled charm. Fig. 2 is an inverted plan of said blank after it has been struck up by the first die operation and the corners of the blank are clipped off. Fig. 3 is a view of the same in cross-section on line *xx* of Fig. 2. Fig. 4 shows in top plan a sheet of hard solder cut into the form of said charm. Fig. 5 is a view of the same in cross-section on line *yy* of Fig. 4. Fig. 6 is a view in top plan of the filling-piece of brass or composition metal cut into the form of said charm. Fig. 7 is a view of the same in cross-section on line *zz* of Fig. 6. Fig. 8 is a view in top plan of the gold cover or facing-plate which is to constitute the upper surface of said charm when completed. Fig. 9 is a view of the same in cross-section on line *ww* of Fig. 8. Fig. 10 is a view in top plan of the sweating or soldering die used in our improved process. Fig. 11 is a view of the same in cross-section on line *vv* of Fig. 10. Fig. 12 is a view in top plan of the clamping-plate used in connection with said sweating or soldering die. Fig. 13 is a view of the same in cross-section on line *uu* of Fig. 12. Fig. 14 is a central cross-sectional view of a forming-die and of the struck-up blank therein and of the solder and filling-piece deposited in the depression of said struck-up blank and also of a forcing plate or plunger to operate in combination with said die. Fig. 15 is a central cross-sectional view of the struck-up blank and of the solder and filling-piece in the depression thereof after the operation illustrated in Fig. 14. Fig. 16 is a central

cross-sectional view of the sweating-die and of the struck-up blank therein and of the solder and filling-piece in the depression of said struck-up blank after the said operation thereon and also of another piece of solder and of the cover, together with the clamping-plate in position for the sweating operation. Fig. 17 is a top plan view of the charm when finished by our improved process. Fig. 18 is a view of the same in cross-section on line *tt* of Fig. 17 before the flange has been removed. Fig. 19 is a view of the same in cross-section on line *tt* of Fig. 17 after the flange shown in Fig. 18 has been cut off.

Our invention relates to the manufacture of gold-filled jewelry; and it consists of the novel method and process of the construction thereof hereinafter particularly described, as specifically set forth in the claims.

In the art of manufacturing gold jewelry those articles are commercially known as "gold-filled" which have a gold or gold-plated shell or exterior portion made in two or more sections and having an inner or filling block or piece made of brass, composition, or other base metal, and it has heretofore been usual in such an article having top and bottom surfaces substantially parallel, with square edges, to solder a band of gold or gold-plated stock along the edges of a filling piece or block all around the same and to solder a top plate and a bottom plate of gold or gold-plated stock upon the top and bottom surfaces of said filling piece or block, which plates overlap and cover the edges of said band. It is, however, practically impossible to conceal the seam—that is, the line of union of said top and bottom plates with the band—and such seams disclose the fact that the article so made is not of solid gold.

It is the purpose of our invention to produce gold-filled jewelry in which the filling metal is condensed and hardened and the seams or lines of union are wholly concealed.

Our improved process is adapted to the manufacture of various articles of jewelry; but for clearness of description and explanation we will suppose that the article which is to be produced by this process is a charm,

such as is worn as an ornament upon a watch-chain.

In Fig. 1 of the drawings, A represents a blank piece of gold which has been rolled into a sheet. This blank is struck up, cupped, or shaped, as usual, by a die and plunger in a drop-press into the required form, and the portion so embossed constitutes a recessed blank or lower part of the shell or covering of the article which is to be made, the turned-up sides forming the edge thereof. These sides are disposed at a slight angle or bevel, as is necessary in die-formed stock in order to give it a proper clearance from the die to remove it therefrom. Fig. 2 is an inverted plan view of said blank A after it has been struck up, as aforesaid, and the corners of the outlying flanges have been clipped off.

B represents a piece or film of hard solder cut from a thin sheet into a shape and of a size, as seen in Fig. 4, to fit into the bottom of the cupped portion of the blank A shown in Fig. 2.

C represents the filling block or piece cast or cut or formed from a thick sheet of brass or base metal into a shape, as seen in Fig. 6, to correspond with and loosely fit in the depressed portion of the struck-up blank shown in Fig. 2. Its edges are beveled, as shown in cross-section in Fig. 7, to fit into said depression in the struck-up blank A, which depression, as is shown in Figs. 2 and 3, has its sides beveled and flaring outwardly. This filling block or piece C is of a thickness exceeding the depth of the depression of the struck-up blank A.

The first operation in our improved process is for the purpose of condensing, hardening, and fitting the filling-block C within the depression of the blank A. This operation is illustrated in Fig. 14 of the drawings, in which D represents in cross-section the die in which the blank A was struck up, (or a die similar to it,) and E represents in cross-section a plunger of a press. The blank A is placed upon the die D, with its embossed portions fitting in the matrix of said die. The piece or film B of hard solder is laid in the depression or recess of the blank A, and the filling-block C is placed in said depression in contact with the piece of solder B. It will be seen that the filling-block C, being thicker than the depth of the depression in the blank A, projects up above the flanges of the blank A. The plunger moving in the direction of the arrow in Fig. 14 strikes with great force upon the upper surface of the filling-block C and condenses and compacts it until its upper surface is flush with the flanges of the blank A, whereupon the parts A, B, and C are removed from the die D. The result of this operation is shown in Fig. 15. The sweating or soldering operation is performed by use of the sweating or soldering die F and the clamping-plate G. The sweating or soldering die F is preferably rectangular and has a central matrix in the upper side thereof, Figs. 10 and

11, of the same shape and dimensions as the matrix of the forming-die by which the blank A was originally struck up. It also has a screw-threaded tap at each corner. The clamping-plate G is rectangular or of a shape to correspond to the top surface of the die F and has at each corner a smooth cylindrical bore *g* and a countersink *g'* concentric therewith. A parting wash of whiting or other suitable substance is given to the matrix and surrounding portions of the die F and also to the under surface of the clamping-plate G.

The composite body which is the product of the condensing operation and which is shown in Fig. 15 is placed in the matrix of the die F, as illustrated in Fig. 16, and on the upper surface of the filling-block C so in position is laid a piece or film B' of hard solder corresponding in shape and size to the piece B shown in Fig. 4 or a trifle larger, and on said piece B' of hard solder is laid a cover or facing plate H, made of sheet-gold, of a size and shape, preferably as shown in Fig. 8, exceeding that of the pieces B' C and extending out somewhat over the flanges of the blank A, as fully illustrated in Fig. 16. The clamping-plate G is then put on over the die F and secured thereto by the clamping-screws I, and said screws are tightened up until the plate G is in forcible contact with the upper portion of the gold covering-plate H, as seen in Fig. 16. Said die F, with the several parts A, B, C, B', and H in position, as just described, and the plate G clamped on said die F by the screws I, is then subjected to heat, which melts the pieces B B' of hard solder *in situ*, thus uniting the filling-block C to the blank A and also to the covering-piece H, and when said die and clamping-plate have been brought to a red or fusing heat they are placed in a vise or in a hydraulic or screw press and forced together, while so heated the screws I allowing such inward movement of the plate G because of the smooth cylindrical bores and countersinks in which the shanks and heads of the screws I, respectively, are loosely mounted. By the heat and pressure so applied the solder is fused and the parts to which it is adjacent are firmly united, and at the same time any excess of such solder is squeezed or forced out and forms an outlying and irregular flange. When this sweating and forcing operation is ended and the die, clamping-plate, and the composite body between them have cooled, said body is removed, and the said irregular flange of surplus solder which has been forced out is trimmed off. The result of this sweating and forcing operation is shown in Fig. 18. The flanges of the facing-plates A and H are then cut off by a suitable cutter, such as is well known in the art, and the finished product is shown in top plan in Fig. 17 and in cross-section in Fig. 19, being a gold-filled article of jewelry whose interior is a dense, hard, and compact block of base metal, but having all its exterior portions of gold.

It is obvious that instead of using gold-stock for the external parts gold-plated stock may be used, except that in such case soft solder should be substituted for hard solder, or the entire filling-block should be made of some soft and easily-fusible metal, and also the exposed edges of the base metal where cut should be electroplated or otherwise colored or covered with gold, when the composite body is finished.

In case the filling-block is itself made of soft solder or of a soft and easily-fusible metal, the separate pieces or layers of solder hereinbefore specified are not required.

The same die may serve as the forming and sweating die, if desired.

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

1. The process of making filled jewelry, which consists of the following steps; preparing a form or recessed blank of the facing metal, seating a filling therein with a film of solder at both sides of said filling, placing a facing-plate over the open side of the blank and applying die-pressure to the composite article while subjected to sufficient heat to fuse the solder, whereby the excess of solder is forced out and the parts firmly united, and

finishing the article, substantially as specified.

2. The process of making filled jewelry, which consists of the following steps; preparing a form or recessed blank of the facing metal, placing in the bottom of the recess of said blank a film of solder, seating in the said recess of the blank in contact with said film of solder a filling-block, whose thickness exceeds the depth of said recess, compacting or condensing by die-pressure said filling-block in position until its upper surface is flush with the upper surface of said recessed blank, placing upon the top of said filling-block a film of solder and upon the top of said last-named film of solder a facing-plate, and applying die-pressure to the composite article while subjected to sufficient heat to fuse the solder, whereby the excess of solder is forced out and the parts firmly united, and finishing the article, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES A. RUSSELL.

EDWARD S. GODDARD, JR.

Witnesses:

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HOWARD A. LAMPREY.