

(No Model.)

C. F. STUBBLES.
PROCESS OF ORNAMENTS METALS.

No. 584,531.

Patented June 15, 1897.

Fig. 1.



Fig. 2.

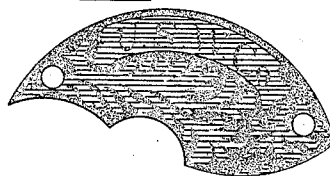


Fig. 3.

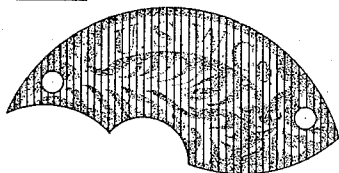
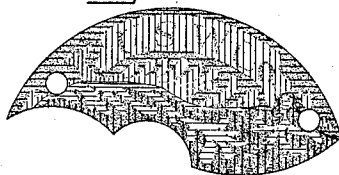


Fig. 4.



Fig. 5.



WITNESSES:

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CHARLES F. STUBBLES, OF WALTHAM, MASSACHUSETTS, ASSIGNOR OF
ONE-HALF TO JAMES E. COX, OF SAME PLACE.

PROCESS OF ORNAMENTING METALS.

SPECIFICATION forming part of Letters Patent No. 584,531, dated June 15, 1897.

Application filed December 21, 1896. Serial No. 616,395. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES F. STUBBLES, of Waltham, in the county of Middlesex and State of Massachusetts, have invented a new and useful Process of Ornamenting Metals, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figures 1, 2, 3, 4, and 5 represent the metal plate as it appears after successive steps in my process.

My invention is a process for ornamenting metal surfaces—such, for example, as the top plate of a watch-movement, and it is the application of my process to such a plate that I shall describe in this specification.

Processes in which a plate of metal was in part covered with an acid-resisting substance, after which the unprotected portion was subjected to the action of an etching fluid, are old and are described in patents to Skinner, No. 72,553, dated December 24, 1867; Goodwin, No. 509,124, dated November 21, 1893, and British patent to Millward, No. 11,416, of 1846; but my process differs materially from any of the processes heretofore known in this that owing to the sequence of the steps of my process I am enabled to obtain four contrasts of surface in the finished plate—for example, bright gilt, bright nickel, satin gilt, and satin nickel.

In performing my process I proceed as follows, the surface to be operated upon being the plates of a watch-movement: For the best results—that is, the most distinct contrast in the finished article—it is desirable that the portion of the surface of the plate which is ultimately to be bright or polished shall be very smooth. The first step in my process consists in covering with any suitable oily substance such portions of the metal as I desire ultimately to be satin finish. As a commercially practical matter for this purpose this design must be put upon the metal by means of a soft pad. The desired design is first engraved upon copper or steel. The lines of the engraving are filled with suitable ink or oily substance. The surface of the plate is then cleaned and the pad pressed upon the plate, the design being transferred to the pad. Those skilled in the art will recognize the fact

that this pad is limited in its capacity to take up wide lines, the lines if too wide not being thoroughly inked. For this reason I always put on the plate by the pad that part of the design of the finished plate which is intended to cover the least surface of the plate, and this is usually in watch-plates the part of the design which is intended to be satin finished for purposes of contrast. Having put on this oily resist I immerse the plate in a suitable electrolytic bath and deposit nickel upon the unprotected surfaces of the plate. The object of this step is twofold. The deposited nickel is susceptible of a higher polish than the base metal upon which it is deposited and is less liable to tarnish, and though this deposit of nickel is ultimately entirely covered it aids the finish of the final deposits of metal to be deposited upon a highly-polished surface. The second object of this deposit of nickel is to serve as a resist against the action of an etching process either by fluid or electrolysis. As in producing watch-plates it is necessary to reduce the cost as much as may be, it is a practical necessity that this varnish or other non-metallic resist be put upon the plate by a pad or other means by which duplicate designs may be quickly applied; but as comparatively large surfaces are often required to be thus covered designs so applied are defective, for the reason that the pad will not thoroughly cover a large surface, the result being that the etching fluid attacks parts of the metal surface which it was intended to protect. By electrically depositing a much harder metal than the base metal upon those parts of the base metal which it is desired to protect, said metal being susceptible of a high polish, absolutely perfect results are obtained however large the surfaces to be protected from the etching fluid.

Having placed the satin-finish design in the oily substance upon the plate and nickled the other portions of the plate and having washed off the oily resist and polished the nickel, I then immerse the plate in a suitable bath, as the anode of an electric circuit, with the result that upon the application of electricity those portions of the plate not covered by deposited nickel are pitted or etched. The result is a plate bright nickel in part and in

part base metal pitted. One result of this etching process is that a fine sediment or scale remains within the pits when the etching process is stopped. As a practical matter, in order that the final result may be good, this sediment or scale must be removed. I accomplish this by immersing the plate in a strong alkaline solution, cyanid of potassium being the best, so far as I know. After washing the alkaline solution off the plate I deposit a film of gold over the entire surface, the result being a plate bright gilt in part and satin gilt in part. I then dry the plate and transfer to the plate by means of a pad or in any suitable way a design in oily ink. Nickel is then deposited upon the exposed parts and the oily ink is then washed off. The resulting plate, if desired, has then portions bright gilt, portions bright nickel, portions satin gilt, and portions satin nickel. It is essential that the gilt shall be applied before the final nickel deposit, as I have described it, for the reason that there is no resist which it is practical to use which will withstand the hot strong alkaline electrolytic solution in which gold must be deposited. Any attempt, therefore, to economize gold by protecting parts of a plate and depositing gold upon the exposed parts would result in stripping off the resist from the protected parts.

I have shown in the drawings the various steps of my process. Fig. 1 shows the appearance of the plate after the first oily design is applied to the plate and the first nickeling performed, the black surface representing the oily resist and the horizontal lines the nickeled surface. Fig. 2 shows the plate after

the oily resist has been removed and the base metal has been pitted or etched in the electrolytic bath, the dotted surface representing the pitted surface. Fig. 3 shows the plate after the washing of the pitted portion of the plate to remove the sediment or scale and the gilding of the entire surface, the perpendicular lines representing the gilt surface, the satin-finished portion of the plate being dotted and perpendicularly lined. Fig. 4 shows the plate of Fig. 3 prepared for the final step in my process by covering those portions of the plate which it is desired shall finally be gilt with an oily resist. Fig. 5 shows the finished plate with its contrasts of bright gilt, bright nickel, satin gilt, and satin nickel, the contrasts being indicated in the conventional manner mentioned above—that is, by horizontal lines for nickel, perpendicular lines for gilt, dotted surface for satin or etched surface, and combinations of horizontal lines and dotted surface for satin-nickel finish, and perpendicular lines and dotted surface for satin-gilt finish.

What I claim is—

The process above described, consisting of covering parts of a base-metal surface with an oily resist; nickeling the uncovered parts; removing the oily resist; etching the base metal; gilding the entire plate; covering parts of the gilt surface with an oily resist and nickeling the uncovered parts.

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Witnesses:

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