(No Model.)

F. ECAUBERT.

METHOD OF MAKING RING DIES.

No. 404,522. Patented June 4, 1889.

Fig. 1.

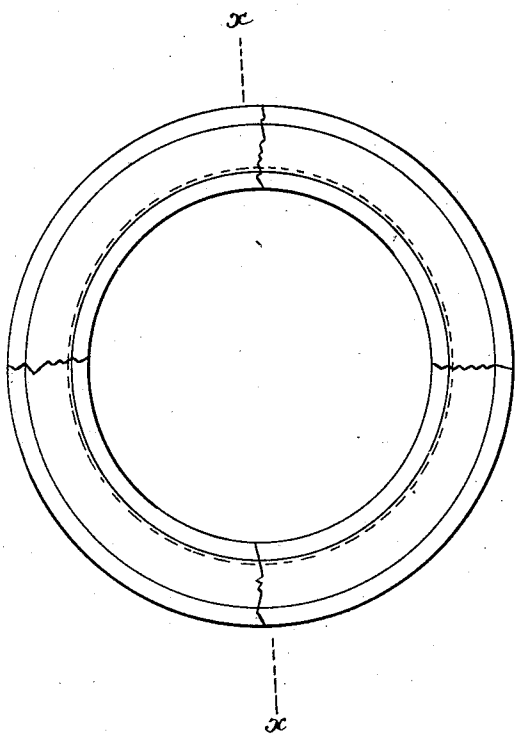
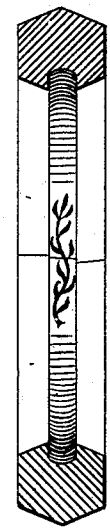


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

FREDERIC ECAUBERT, OF BROOKLYN, NEW YORK.

METHOD OF MAKING RING-DIES.

SPECIFICATION forming part of Letters Patent No. 404,522, dated June 4, 1889.

Application filed November 5, 1888. Serial No. 289,972. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC ECAUBERT, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in the Method of Making Ring-Dies, of which the following is a specification.

Dies for making the exterior surface of watch-case centers and similar articles have been made in the form of a ring, with the reverse engraving upon the interior surface of such ring; but where the metal is forced into recesses in the pattern engraved upon the interior of the steel ring the said steel ring-die cannot be removed from the finished article unless the same is made in sections.

In dies for making watch-case centers I have heretofore constructed a ring-die in two, three, or more pieces; and in order to finish up the ends of the segmental arcs composing the rings it has been necessary to file and fit the steel while in a soft condition, and it is practically impossible to bring the ends of the steel sections together with sufficient accuracy to prevent a fin or imperfection appearing upon the surface of the article that is struck up or rolled into the circular die; and in addition to this I have found that when the sections are put together for composing the steel ring and the interior surfaces of such sections are engraved while the steel is soft the operation of hardening the steel renders the sections of the ring untrue, so that they are generally on their faces arcs of circles described with a longer radius than they were when in the soft and untempered condition.

My improved method of manufacturing ring-dies is an improvement upon the foregoing methods, for the purposes of obviating the difficulty arising in the tempering of the steel segments and for rendering the joint between one section and the next invisible both in the die and in the product made in the die. With this object in view I turn up or otherwise form a ring of steel of the proper size and shape, with the interior surface or edge corresponding to the contour of the article to be manufactured, and when the surface of that article is to be ornamented the surface of the die is recessed to correspond to the relief ornaments of the finished article; and my present improvement is adapted to any ring-die having an interior finished surface for the production of watch-case centers or other articles by pressure from a roller, as in my Patent No. 253,355, or otherwise.

After the die has been completed so far as the size, ornamentation, &c., is concerned, the die is hardened in any usual manner, and in so doing the ring shape of the die is not disturbed perceptibly. I then break the ring up into two, three, or more pieces, care being taken to obtain fractures as nearly in the radial lines as convenient, and I find in practice that the ring-die can be broken into two, three, or more pieces, when of the proper temper for use, without the die being bent or disturbed in its shape by the breaking operation. The consequence is that the rough surfaces of the fractures match exactly when the parts of the ring are properly set together, and it is impossible to set the parts of the ring closely together when either section is misplaced, because no one fracture will correspond to another fracture, and when the sections of the ring are set together the fractures are substantially invisible, and when the ring-shaped die is inserted into the proper holder—such, for instance, as that shown in my aforesaid patent—the watch-case center or other ring can be spun, rolled, or otherwise pressed to shape within the ring-shaped die, so as to receive the pattern engraved upon the inner surface of such die, and the lines of fracture will not be apparent upon the surface of the watch-case center or other article, thereby obtaining a better finish upon the article made in such circular die than has heretofore been possible in ring-shaped dies made up in sections.

In the accompanying drawings, Figure 1 represents one side of the ring-die with the lines of fracture in the same, and Fig. 2 is a section of such die at the line $x\ x$ of Fig. 1.

I claim as my invention—

The method herein specified of manufacturing annular dies, consisting in finishing up the ring of soft steel with the necessary contour, engraving, or ornamentation upon

the interior surface thereof, hardening the said ring, and afterward breaking the ring apart into two or more sections adapted to being placed together for use or removed from the article that is rolled or otherwise formed to shape within such ring-shaped die, substantially as set forth.

Signed by me this 1st day of November, 1888.

F. ECAUBERT.

Witnesses:
GEO. T. PINCKNEY,
WILLIAM G. MOTT.