(No Model.) 2 Sheets—Sheet 1.

E. LEACH.

MACHINE FOR DECORATING WATCH CASES.

No. 425,807. Patented Apr. 15, 1890.

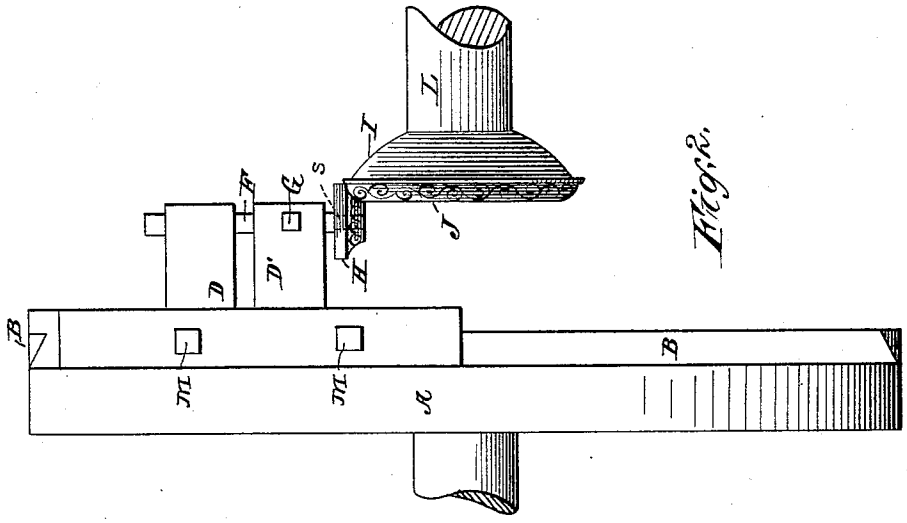


Fig. 2.

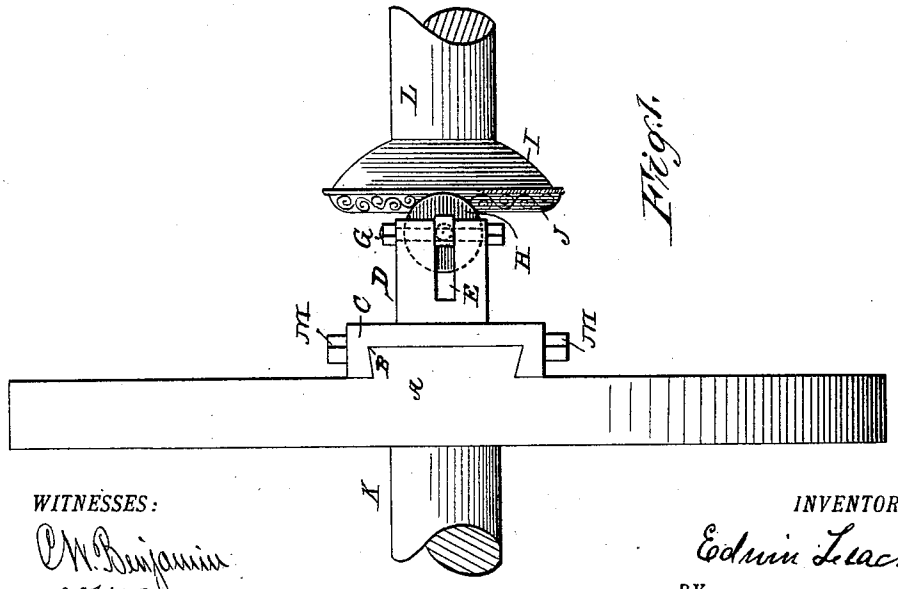


Fig. 1.

WITNESSES:

C. M. Benjamin

B. F. Williamson.

INVENTOR

Edwin Leach

BY

S. D. Morris

ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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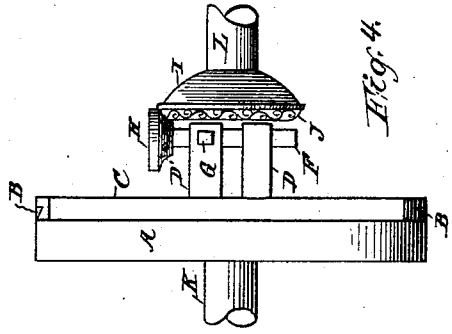


Fig. 4.

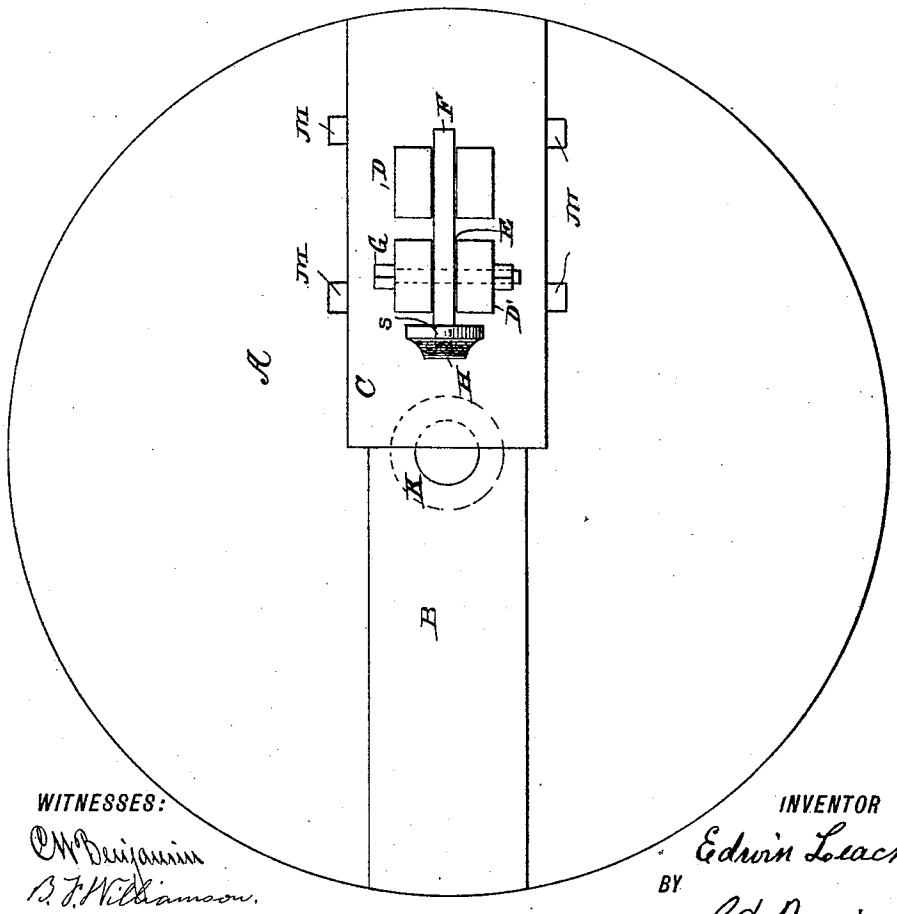


Fig. 3.

WITNESSES:
C. M. Benjamin
B. F. Williamson.

INVENTOR
Edwin Leach
BY
S. D. Morris
ATTORNEY

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWIN LEACH, OF BROOKLYN, NEW YORK.

MACHINE FOR DECORATING WATCH-CASES.

SPECIFICATION forming part of Letters Patent No. 425,807, dated April 15, 1890.

Application filed January 6, 1888. Serial No. 259,989. (No model.)

To all whom it may concern:

Be it known that I, EDWIN LEACH, a citizen of the United States, residing at Brooklyn, in the State of New York, have invented a new and useful Improvement in Machines for Decorating Watch-Cases, of which the following is a specification.

This machine is intended to do work in imitation of and to answer the purpose of hand-engraving on the backs, caps, and centers of watch-cases, and in such a manner that the design or pattern may be either sunk in or raised on the work without warping it or appreciably changing its dimensions or reducing its weight. The decorating can, moreover, be done after the joints are put on the backs and caps. I thus avoid heating and repolishing the backs and caps after the decorating operation, and the decoration consequently retains the brilliant coloring which has heretofore been peculiar to hand-engraving.

In carrying the invention into effect the article to be decorated or embellished is kept stationary—that is to say, non-rotary and immovable edgewise in the machine—while a die-roll by which the decorating is done is revolved in a circle, the die-roll rotating at the same time upon its own axis in contact with the stationary article. This double or compound or planetary motion is found to be highly effective. The die-roll, if accurately proportioned to the work, may be revolved upon the article in one direction continuously until the decoration is raised or sunk to the required extent; but perfect proportioning in every instance is practically impossible, owing to slight changes in the die-rolls when hardened and minute variations in watch-case parts of a given style and size. I meet this difficulty by revolving the die-roll upon the article first in one direction and then in the other reciprocally.

The die-rolls used in decorating the backs and caps of watch-cases are made with their peripheral "faces" at less than a right angle with their sides or ends, the angles varying according to the width of the decoration, and their faces are simply beveled or beveled and concaved, as may be required, to conform each to the radial contour of the surface it is to embellish. The greatest diameter of the die-roll may be equal to the diameter of the outside circle of the decoration, or a fraction of the latter, the smaller size being more generally required.

In decorating the centers of watch-cases in any kind of figure, design, or pattern to take the place of hand-engraving the same double or compound or planetary motion of the die-roll is used, the article remaining stationary, the die-roll being made with its peripheral face at right angles to the sides or ends thereof, and either "flat" or concave to conform it to the shape of the outer surface of the center.

The present invention consists in certain novel combinations of parts, as hereinafter set forth and claimed, the general combination constituting the essential parts of a machine for decorating watch-case backs and caps constructed on the aforesaid principles.

Two sheets of drawings accompany this specification as part thereof.

Figure 1 of the drawings may represent a top view of the main working parts of said machine for decorating watch-case backs and caps in operation. Fig. 2 may represent a side view of the same. Fig. 3 represents a face view of the face-plate seen at the left in Figs. 1 and 2; and Fig. 4 is a view similar to Fig. 2, representing a slight modification of the same machine.

Like letters of reference indicate corresponding parts in the several figures.

The construction and operation of my said machine as it is shown in said drawings are as follows:

A circular face-plate A is provided with a guide-rib B, extending diametrically across its face. Attached by and sliding upon said rib is a radial slide C, containing a groove which is fitted to the rib. Attached to and forming part of the slide C are posts or lugs D D′, having "slots" E in line with the rib. An arm or die-holder F is inserted in said slots E, and is pivoted to the lug D′ by a transverse bolt G. The object of this construction is to allow the die-roll H to be readily adjusted to any required angle with its axis in a plane uniformly radial to the axis of revolution, and also to be adjusted bodily toward and away from said axis of revolution for work of different shapes and diameters. By employing a circular face-

plate having a guide-rib which extends diametrically across its face the revolving parts are "balanced" to a considerable extent; but these and other mechanical details shown by way of illustration are not essential to my invention, except as hereinafter stated in my respective claims.

The end of the arm or die-holder F which carries the die-roll H is cylindrical, so as to allow the die-roll to freely rotate thereon, and the die-roll at its end farthest from said axis of revolution, hereinafter termed its "outer" end, has a bearing against a shoulder *s*, formed on the die-holder. Said outer end of the die-roll is always its larger end. In operation, consequently, the only tendency of the roll to escape is radially outward, and by arranging the parts, as shown in Figs. 1, 2, and 3, so that the die-roll spindle is formed on the die-holder at that end of the latter nearest the center of the face-plate the die-roll is held in place by the work against a solid and easily-formed shoulder, and is readily applied and removed when the work is not in place. Otherwise the die-holder F or the slide C, with all its appurtenances, may be reversed end for end, as shown in Fig. 4.

The die-roll H (represented in the drawings) has an engraved peripheral face which is both beveled and concaved, as aforesaid, to conform it to the surface to be decorated. Its larger diameter is an aliquot fraction of the diameter of the outer circle of a given annular surface to be decorated, and its smaller diameter bears a like proportion to the inner circle of said surface. A surface speed proportioned as closely as possible to the circumferential travel at each circle and at each intermediate point is thus provided for.

A form I, which supports the back or cap J to be decorated, is arranged in front of the face-plate A and axially in line with the shaft K, which carries the latter. The form is mounted upon the protruding end of an axial non-rotary spindle L, which slides in a foot-stock like the tail-stock of a lathe, and is adjustable lengthwise by a screw at the back of the foot-stock. The function of the adjusting-screw is to bring the article to be decorated in contact with the die-roll H with the requisite pressure.

In operating the machine the back or cap J is placed upon the form I and held stationary, as aforesaid, and an appropriate die-roll H is applied to the die-holder F. The slide C, carrying the lugs D D′, the die-holder F, and the die-roll H, is moved along the guide-rib B, so as to locate the die-roll with reference to the diameters of the surface to be decorated, and is firmly held in position by tightening its screws M. The die-holder F is then turned on the bolt G, so as to bring the peripheral face of the die-roll H into proper contact with the article J, and is firmly fastened in this position, as by tightening said bolt G or by applying an ordinary screw-clamp to the slotted post D. After once adjusting the attachments to the face-plate A, as aforesaid, they need not be touched ordinarily until any given lot of backs or caps of a given size and style are completed. The work is finally pressed against the die-roll H by a slight turn of the screw which adjusts the spindle L, as aforesaid, and the die-roll is caused to revolve continuously or reciprocally, as aforesaid, around the center of the work, as by means of a pulley on the shaft K, while it rotates correspondingly on its own axis, owing to said revolving motion and its contact with the work.

Any desired design or figures may thus be rolled upon or into the article J, the properly-proportioned die-roll H being first provided with such design or figures in reverse on a peripheral face of the required shape.

I do not claim herein the within-described process of decorating a watch-case back, cap, or center by transferring thereto the desired design from a die-roll by a rolling operation, the article being kept stationary while the die-roll is revolved around the center of the surface to be decorated, and is permitted to rotate freely on its own axis; nor in such art the process of compensating for slight inaccuracies in the proportioning of the diameters of the die-roll to those of the work, which consists in keeping the work stationary and revolving the die-roll around the center of the surface to be decorated first in one direction and then in the other reciprocally; nor the process of so decorating watch-case backs and caps after their joints are put on, whereby the brilliant coloring heretofore peculiar to hand-engraving is preserved, all of which is claimed in another specification forming part of a divisional application filed June 30, 1888, Serial No. 278,637.

I claim as my invention and desire to patent under the present specification—

1. In combination, the face-plate A, having the guide-rib B, the slide C, the posts or lugs D D′, having slots E, the arm or die-holder F, bolt G, die-roll H, spindle L, form I, and shaft K, all arranged to operate in the manner above described.

2. The combination, with the face-plate A, having a guide-rib on its face, of the slide C, guided radially by said rib and provided with fastening devices, the die-holder F, mounted on said slide, movable angularly in the same radial plane and having a die-roll spindle in said plane, means for fastening said die-holder at different angles, and a rotary die-roll having a peripheral face and mounted on said die-roll spindle, substantially as set forth.

3. The combination, in a machine for decorating watch-case backs and caps, of a die-roll having a peripheral face of different diameters conformed to the surface to be decorated, a die-holder movable angularly in a given radial plane and having a die-roll spindle in said plane, upon which said die-roll ro-

tates, and means for fastening said die-holder at different angles, substantially as hereinbefore set forth.

4. The combination, in a machine for decorating watch-case backs and caps having a given axis of revolution, of a die-holder radial to said axis and having a free-ended die-roll spindle at its end nearest said axis and a shoulder at the end of said spindle farthest from said axis, and a die-roll of different diameters which rotates freely on said spindle, with its end of largest diameter farthest from said axis and against said shoulder, substantially as hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 3d day of January, 1888.

EDWIN LEACH.

In presence of—

S. STEWART WHITEHOUSE,

FRED W. ROWE.