(No Model.)

T. F. PROCTOR.

APPARATUS FOR FIGURING WATCH DIALS.

No. 310,313. Patented Jan. 6, 1885.

Fig. 1.

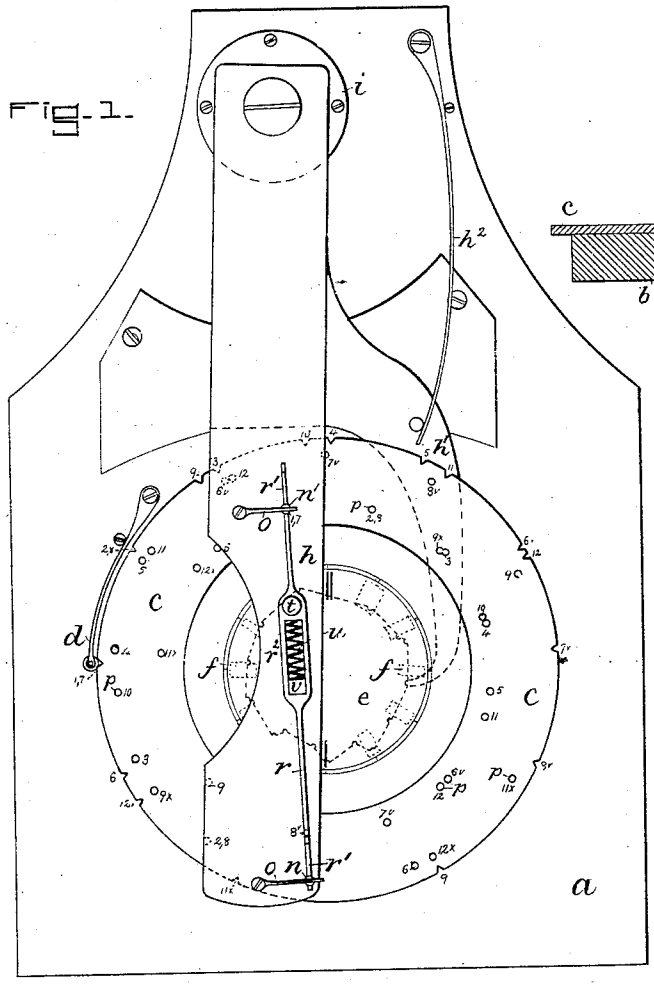


Fig. 3.

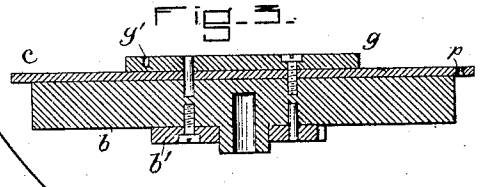


Fig. 4.

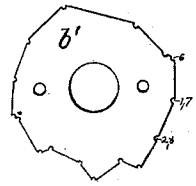
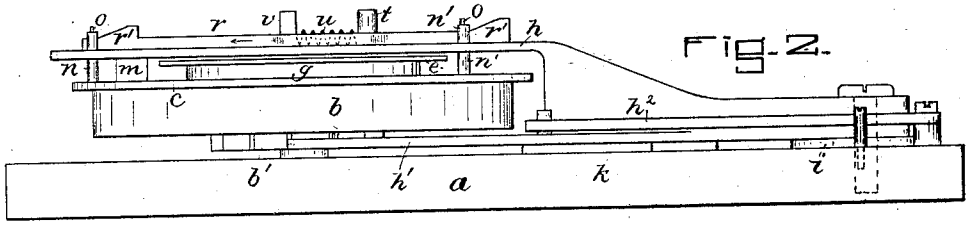


Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR FIGURING WATCH-DIALS.

SPECIFICATION forming part of Letters Patent No. 310,313, dated January 6, 1885.

Application filed December 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. PROCTOR, of Waltham, county of Middlesex, State of Massachusetts, have invented an Improvement in Apparatus for Figuring Watch-Dials, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to an apparatus for applying the figures or other marks or decorations to watch-dials, and has for its object to enable the said figures to be applied with greater accuracy and rapidity than when done by the ordinary method.

Heretofore in figuring dials the coloring matter or pigment has been applied to the surface, and after it has hardened somewhat the superfluous portions have been cut or scraped away, leaving only the desired lines, by means of a tool manipulated by the operator, and guided by a straight-edge held by the hand in proper position, the dial having been previously spaced around. The figuring thus depends upon the accuracy of the eye and steadiness of hand of the operator, and the dial is usually previously marked or spaced off by pencil-marks to assist in guiding the operator.

My invention consists in providing the usual bed-plate and turn-table for holding the dial while being operated upon with a tool-guiding device or straight-edge and means to mechanically hold it in the proper relation to the dial for cutting each of the strokes of all the different figures, as for defining other marks or decorations on the dial. As herein shown, the straight-edge is pivoted at one end upon the bed in such position that its edge may be swung across the face of the dial, it normally standing nearly diametrically across it. The said straight-edge is provided with, preferably, two pins, to enter corresponding sockets in a plate connected with or forming a part of the turn-table, the said sockets being properly located to hold the said straight-edge in proper position for each stroke of each figure of the dial. The said pins are shown as acted upon by springs which throw them down into the sockets in the said plate, and a pin-lifting device is employed for withdrawing the said pins when the straight-edge or turn-table is to be moved. The holding-pins are sufficient to determine the relative position of the straight-edge and turn-table, with the dial thereon; but for greater convenience in manipulation the turn-table is provided with a controlling-plate having a notched periphery, and a stop or holding device co-operates with the said plate to arrest it in its rotary movement when in proper position to have a line cut. A cam, also carried by the turn-table, controls the lateral movement of the straight-edge relative to the dial, so that by merely rotating the turn-table from one position to the next the straight-edge or tool-guide will be placed in the proper position and securely held there while the dial is being operated upon.

Figure 1 is a plan view of an apparatus for figuring watch-dials embodying this invention; Fig. 2, a side elevation thereof; Fig. 3, a vertical section of the turn-table and parts connected therewith, and Fig. 4 a plan view of the cam for controlling the position of the tool-guide detached.

The bed *a*, of suitable form, has pivoted upon it the turn-table *b*, provided with a regulating-plate, *c*, having a notched periphery to be engaged by the spring-holder *d*, by which it is held in certain definite positions and turned through a definite angle each time it is moved to a new position. The dial *e* to be operated upon, previously provided with the coloring-matter, as shown by the dotted lines at *f*, may be mounted upon the said turn-table or plate *c* in any suitable or usual manner, preferably as described in a former application for Letters Patent filed by me November 13, 1882, the said turn-table carrying a dial-holding plate, *g*, provided with sockets *g'*, to receive the feet or pins by which the dial is to be subsequently attached to the plate of the watch. The dial is thus held in a definite position on the turn-table, having a definite relation to the position it is to occupy in the watch, so that the figures or decorations will be in the proper position when the dial is mounted on the watch-works and the latter placed in the case. In finishing the figuring or decorations the superfluous coloring-matter is removed to leave the strokes of the figures by a cutter or scraping-tool guided by a

straight-edge, *h*, which in the present invention is pivotally connected with the bed-plate *a* at the pivot-block *i*, and is supported by a guide, *k*, at the proper distance above the dial, the said guide and pivot permitting the straight-edge to be moved across the dial to any desired position, its free end being preferably provided with a foot, *m*, resting upon the plate *c*. The dial is turned, with the plate *c* and turn-table, to the proper position for each number to be cut, and is held in such position by the spring-holding device *d*, and in order to automatically place the straight-edge in exactly the right position for making each stroke of the cutting-tool the turn-table *b* is provided with a controlling-cam, *b'*, co-operating with an arm, *h'*, connected with the straight-edge *h*, pressed by a spring, h^2, against the said cam, which thus determines the position of the straight-edge relative to the dial as the latter is rotated with the turn-table to each new position determined by the notches in the periphery of the plate *c*. The surface of the cam is preferably provided with recesses corresponding in position to the notches of the plate *c*, so that it alone might determine the amount of rotation of the turn-table and hold it in its different positions in addition, to determine the angular position of the straight-edge.

In order to hold the straight-edge with the utmost rigidity, it is locked in engagement with the said plate *c* and turn-table by an engaging or locking device, shown as consisting of the pins *n n'*, pressed downward by springs *o*, so that they will drop into the sockets *p*, made in the plate *c*, when brought in line therewith in the movement of the straight-edge across the dial, caused by the spring h^2 and cam *b'*. The sockets *p* are so located as to hold the straight-edge in the proper position for the different strokes of the cutter, so that they may be made with accuracy and are not dependent upon the judgment of the operator, nor upon the correctness of his eye.

In order to enable the engaging-pins *n n'* to be quickly removed from their sockets, so that the straight-edge may be moved from one position to another with small expenditure of time, a pin-lifting device is employed, consisting of a slide, *r*, having cams or inclines *r'* at its ends, passing through openings in the pins *n n'*, so that by its movement in the direction of the arrow, Fig. 2, it lifts both the pins simultaneously. The said slide is provided with a handle, *t*, and is acted upon by a spring, *u*, which tends to keep it in the proper position to allow the pins to drop into their sockets. The said spring *u* rests against a projection, *v*, on the straight-edge, and the slide *r* is slotted, as at r^2, embracing the said spring and the projection *v*, and being thus partially guided thereby. The notches on the plate *c* and the holes therein are marked to correspond with the figures they are to produce, the letter X or V being used when the heavy stroke of a letter X or V is to be produced.

The apparatus is shown in Fig. 1 as set in position to make the figure 1 and two straight marks of figure 7, the notch marked 1 7 of the plate *c* being engaged by the holding device *d*, the recess marked 1 7 on the cam *b'* (see Fig. 4) receiving the roller at the end of arm *h'*, and the pins *n n'* being in the sockets bearing the same mark in the plate *c*, the sockets for the former pin being nearer its periphery, while those for the pin *n'* are nearer the center. After the figure 1 and straight marks of figure 7 have been made, as shown, the slide *r* is operated by pressing the handle *t* toward the handle *v*, raising the pins from their holding-sockets, and the plate is rotated, preferably in the direction of the hands of a watch, until the notch-mark 6 of the plate *c* receives the roller of the holding device *d*. The straight-edge will then be thrown by the spring h^2 and cam *b'* in position for the pins *n n'* to drop in the sockets marked 6, and will be in proper position to cut the straight mark of the figure 6.

It will be seen that the V portion of the figure 7 is covered and protected by the straight-edge while cutting the straight marks in like manner, or when the parts are brought in proper position to cut the V of the figure 7 the straight marks thereof will be beneath the straight-edge, and the same is true for the other figures of like character.

For different dials, or for different styles of figuring, the controlling-plate *c*, with its notches and pin-sockets, and the cam *b'*, will have to be varied, and the said plate and cam are shown as detachable from the turn-table *b*, they being held in proper position thereon by pins and screws, as shown in Fig. 3, so that they can be easily removed and others substituted.

It is obvious that the parts *b*, *b'*, *c*, and *g* (shown in Fig. 3) might all be made in a single piece; but as the shape of the part *b'* and the notching and boring of the part *c* have to be varied it is more convenient to make them in separate pieces, as shown.

It is obvious that one of the pins *n n'* and the corresponding series of sockets might be omitted, or that when two are used they will be sufficient to determine the relative position of the straight-edge turn-table, so that the cam *b* and the holding device *d* might be omitted, the operator merely turning the turn-table with one hand and moving the straight-edge across it until the pins drop into the proper sockets. It is also evident that the pins might be wholly omitted, the position of the straight-edge being determined, and it being held by the cam *b'* and spring *h'*. It is preferable, however, to employ all the devices as shown for thus determining with greater accuracy the movements of the cutting-tool.

It will be understood that a guide of this kind having its position mechanically fixed

with relation to the dial might be employed for other implements than scraping-tools, such, for instance, as fine brushes, by which the fine marks of the X's and V's are applied, and that the guiding-edge of the tool-guiding device *h* is not necessarily straight, as it might be employed for producing other work than the figuring, such as various ornamental designs upon the face of the dial.

Instead of having the straight-edge move laterally across the bed-plate, the dial having its center of rotation fixed relative to the said bed-plate, it will be seen that the straight-edge might have any lateral movement, while the turn-table might be pivoted in a carriage or on an arm to slide or spring bodily transversely to the said straight-edge, its lateral movement being then guided, if desired, by a cam similar to the one *b'* co-operating with a stud fixed upon the bed-plate. This construction is equivalent to that herein described, and will be specifically claimed in another application in connection with other novel features.

It will be seen that by the herein-described apparatus, in connection with a method and apparatus for applying coloring-matter, the entire process of figuring the dials may be performed without using guide-marks upon the face of the dial, having to be subsequently erased, and that a great saving in time is thus effected, while equally good work can be accomplished with less experience and skill on the part of the operator, and no dials are damaged in the process of figuring them or decorating their surfaces.

In Letters Patent granted to me July 11, 1882, I have described an apparatus in which the tool itself is mechanically moved and guided in definite relation to the dial.

In the present application the tool is intended to be manipulated by the hand of the operator; but the guide for it has its position automatically determined, and is mechanically held while the tool is being operated.

I claim—

1. In an apparatus for figuring or decorating dials, the turn-table adapted to be moved through definite predetermined angles, and means to hold the dials in definite position thereon, combined with a tool-guiding device for a hand-operated tool, and the connecting mechanism between the said turn-table and guiding device, whereby the latter is held in different definite positions corresponding with the different positions to which the turn-table is moved, substantially as and for the purpose described.

2. The turn-table and controlling-disk provided with pin-sockets, combined with the tool-guiding device, spring-pressed pins thereon to enter the said sockets, and pin-lifting device, substantially as described.

3. The turn-table, combined with the straight-edge, provided with spring-pressed pins, and the spring-pressed slide having inclines for operating the said pins, substantially as described.

4. The turn-table, and means, substantially as set forth, to hold a dial in definite position thereon, and a tool-guiding device, combined with a cam, whereby the relative position of the said turn-table and tool-guiding device is determined, substantially as described.

5. The rotating dial-holding table *b* and disk *c*, connected therewith, having a notched periphery, combined with the cam *b'*, connected with the said table, substantially as described.

6. The turn-table and controlling-disk provided with pin-sockets, combined with the movable tool-guiding device and pins connected therewith co-operating with the said pin-sockets, whereby the said guiding device is locked in definite positions with relation to the turn-table, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOS. F. PROCTOR.

Witnesses:
JOS. P. LIVERMORE,
BERNICE J. NOYES.