

(No. Model.)

2 Sheets—Sheet 1.

D. R. BUCHANAN & E. L. DODGE.

PRODUCING UPON THE DIALS AND FACES OF WATCHES THE PAINTED
ROMAN CAPITAL NUMERAL LETTERS.

No. 323,272.

Patented July 28, 1885.

Fig. 1.

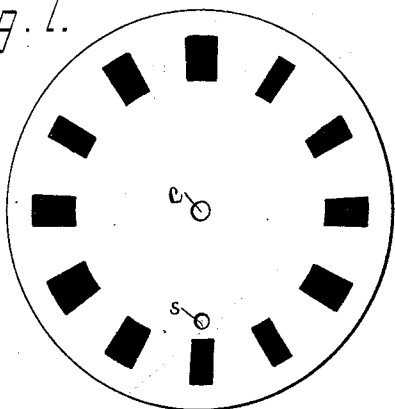


Fig. 2.

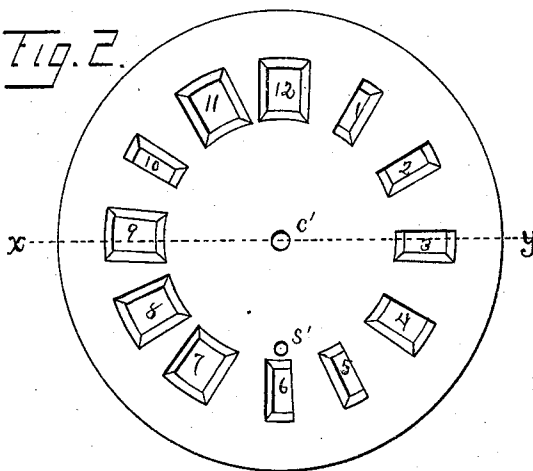


Fig. 3.



Fig. 4.

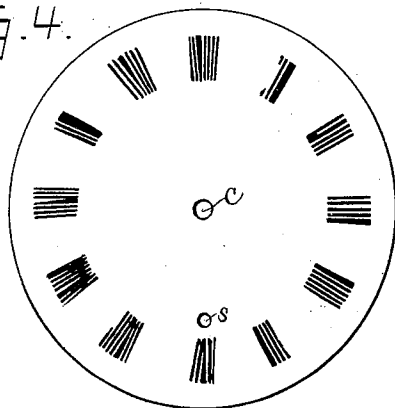


Fig. 5.

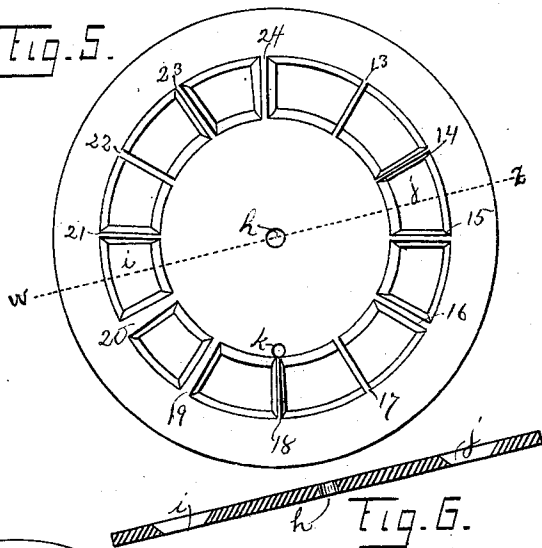


Fig. 6.

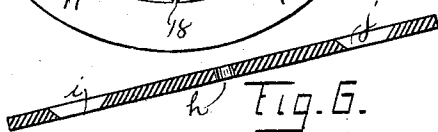
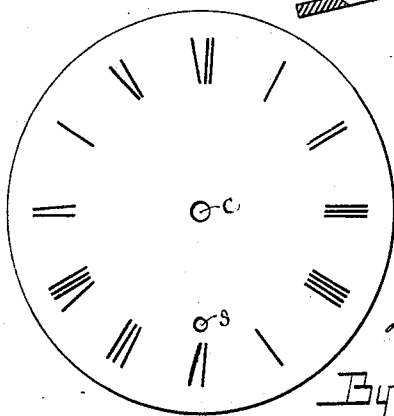


Fig. 7.



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(No Model.)

2 Sheets—Sheet 2.

D. R. BUCHANAN & E. L. DODGE.

PRODUCING UPON THE DIALS AND FACES OF WATCHES THE PAINTED
ROMAN CAPITAL NUMERAL LETTERS.

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Fig. 8. Fig. 9.

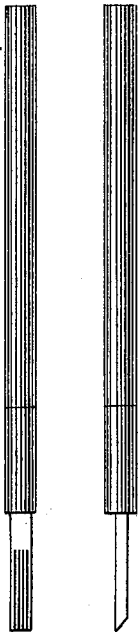
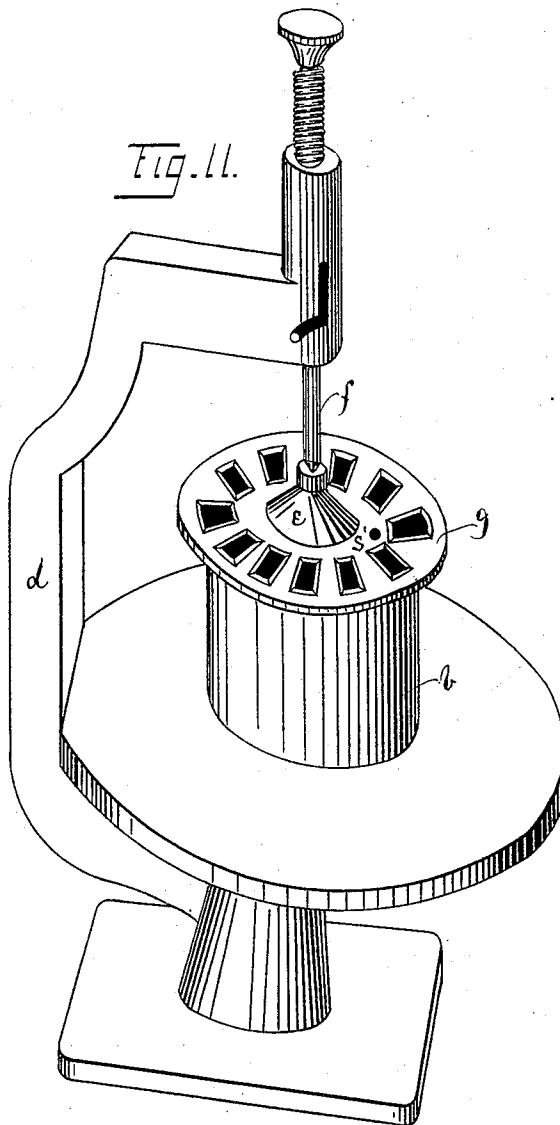


Fig. 10.



Fig. 11.



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UNITED STATES PATENT OFFICE.

DAVID R. BUCHANAN AND EDWARD L. DODGE, OF SPRINGFIELD, ILLINOIS,
ASSIGNORS TO RYLAND L. TAFT, OF SAME PLACE.

PRODUCING UPON THE DIALS AND FACES OF WATCHES THE PAINTED ROMAN CAPITAL NUMERAL
LETTERS.

SPECIFICATION forming part of Letters Patent No. 323,272, dated July 28, 1885.

Application filed December 17, 1883. (No model.)

To all whom it may concern:

Be it known that we, DAVID R. BUCHANAN and EDWARD L. DODGE, citizens of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Producing upon the Dials and Faces of Watches the Painted Roman Capital Numeral Letters Representing the Hours; and we do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has relation to improvements in devices for producing upon the dials of watches Roman capital numeral letters; and it consists in the construction, combination, and adaptation of parts, as will be hereinafter more fully set forth, and particularly pointed out in the claims appended.

The objects of our invention are, first, to rule in the letters representing the hours, so that the center of the heads of the hour-letters shall be the exact hour-point, and so that the hour and minute subdivisions of the dial, when the two independent operations are completed, shall coincide with mathematical precision; second, to give to the letters representing the hours their proper and exact angle and proportion; third, to secure the highest possible degree of uniformity; fourth, to remove the superfluous paint lying outside the hour-letters, after ruling, quickly and without danger of injury from the cleaning-point to the letters themselves; fifth, to mechanically facilitate the operations of ruling the hour-letters and cleaning off the superfluous paint, thereby materially reducing the cost and expense of hour-lettering dials. These objects are attained by the aid of the mechanism illustrated in the accompanying drawings.

Figure 1 is an ordinary watch-dial having the twelve hour-blocks painted thereon. It is to be seated upon a revolving cylinder (see Fig. 11) having two metal pins so set as to pass through and rise above the center hole, *c*, and seconds-hole *s* of the dial, and projecting above the face of the latter.

Fig. 2 is the circular ruling-plate of suitable

thickness and somewhat larger than the dial, its center hole, *c'*, and seconds-hole *s'* corresponding with the like holes in the dial (Fig. 1, *c* and *s*) to be ruled, the twelve openings or slots in the plate, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, of the proper size, location, proportion, and angle to cover the painted hour-blocks on the face of the dial when the ruling-plate is passed over the projecting pins in the revolving cylinder and rests on the face of the dial.

Fig. 3 is a cross-section through the line *x y* of the ruling-plate, Fig. 2, showing the center hole, *c'*, and slots 3 and 9, and the relative thickness of the plate.

Fig. 11 is the working-stand, with its revolving cylinder *b*, its arm *d*, its shoe *e*, and movable rod *f*, the dial, as in Fig. 1, with its painted hour-blocks resting on the top of the revolving cylinder *b*, the ruling-plate *g* resting on the face of the dial and made to take its true position by the pins from the revolving cylinder passing through the center holes and seconds-holes of both the dial and ruling-plate, the dial to be ruled and the ruling-plate both firmly held in place by the shoe and movable rod being pressed down upon them and there locked, all in position for use.

Figs. 8, 9, and 10 are the ruling-cutter, Fig. 8 showing a front, Fig. 9 a side, and Fig. 10 a cross-section, view, all necessarily enlarged to show its form and construction.

The operation of ruling is performed, the dial to be ruled and the ruling-plate in position as shown in Fig. 11, by the operator passing the ruling-cutter successively over the painted spaces exposed in the twelve slots or openings in the ruling-plate, the two sides of the slots or openings acting as guides, and thus ruling or cutting out (removing the paint from) the spaces between the body of the several letters; and this operation, which by the methods heretofore known and practiced was slow, laborious, inaccurate, unsatisfactory, and expensive, by the aid of the ruling-plate is rendered easy, certain, and rapid, requiring no special skill and training of the operator, producing hour-letters true and exact in position, proportion, and angle, and dials of

absolute uniformity, at an expense of not exceeding thirty per cent. of the old method.

Fig. 4 is a dial after ruling.

Fig. 5 is the circular cleaning-plate corresponding in size with the ruling-plate, Fig. 2, with corresponding center and seconds hole, h and k , and with twelve radiating arms, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24, of such width, position, proportion, and angle as when resting on the face of a ruled dial, as Fig. 4, the radiating arms shall exactly cover the body of the ruled hour-letters and expose through the openings in the cleaning-plate the surplus paint on the face of the dial lying outside the body of the hour-letters.

The cleaning-plate being in position, (covering the dial as the ruling-plate does in Fig. 11, and held in position in the same way,) the superfluous paint is removed by the use of an ordinary boxwood or other proper point in the hands of the operator, the radiating arms of the plate exactly covering and protecting the body of the hour-letters from contact with or injury from the instrument made use of in removing the superfluous paint from the face of the dial.

By the aid of the cleaning-plate the operation of removing the superfluous paint on the face of the dial outside the body of the hour-letters is rendered simple, certain, and rapid, requiring no special skill or training of the operator, and removes all liability of injury to the body of the hour-letters as they have been ruled.

Fig. 6 is a cross-section of the cleaning-plate, (indicated by the dotted line n and z in Fig. 5,) and shows the relative thickness of the plate, the center hole, h , and the openings i and j .

Fig. 7 is a dial after cleaning.

It will be perceived that the side walls of the radial slots or openings in the ruling-plate are beveled or inclined from below upwardly and outwardly—that is to say, the side walls of the large slots, or those in which the ruling implement is given the second stroke, or passed along each side wall of the said openings—it not being necessary to have both side walls of the narrow slots beveled, as the ruling implement is passed along but one of the walls; or, in other words, there is only one stroke or movement of the instrument made in the small or narrow slots, and that is made with the marker engaging the beveled side of the said slots. I attach importance to this manner of forming the slots, as they permit of rapidity

in ruling the marks on a dial, and require less care and experience to manipulate the ruling-instrument. I have found by experience that where the side walls of the slots are perfectly vertical it is difficult for an inexperienced or nervous person to squarely seat all the points of the ruling device upon the dial, as, should the operator incline the position of the ruling instrument from a vertical plane, the result would be that all of its points would not mark plainly, but may make a broken line by engaging the colored surface at intervals in the path of its direction. The beveled or inclined sides will be readily appreciated by those familiar with the art of ruling dials. It will also be seen that the side walls of the slots in the clearing-plate are conformably beveled or inclined, as more fully shown in Fig. 5 of the drawings.

We are aware that it is not new to provide a templet with a central perforation, a fourth hole, and a circular series of radial angular apertures adapted to correspond in position to the hour-marks, and to serve as guides for the cutters in ruling the marks, and that such templets have been provided with radial bars adapted to cover and protect the lines left for the hours in cleaning off the surplus paint, and therefore do not claim such devices, broadly, as the same has been patented to R. L. Taft in an application allowed December 23, 1884.

We are also aware that it is very old to provide ruling-instruments with beveled edges—such, for instance, as the ordinary ruler having its bevel downward and inward when in a position for use—so as to keep the ruling-edge from direct contact with the paper or article being ruled upon.

Having described this invention, what we claim as new, and desire to secure by Letters Patent, is—

In a machine for ruling dials, the combination of the main frame or stand, the revolving cylinder b , having the fixed pins adapted to enter the center and fourth hole of a dial and ruling and clearing plate interchangeably, and the vertical movable rod f , having the circular shoe e , to engage and hold the said ruling and clearing plates down upon a dial, substantially as specified.

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