(No Model.)

# M. V. B. ETHRIDGE.

## TIME PIECE DIAL.

No. 347,337. Patented Aug. 17, 1886.

FIG. 1.

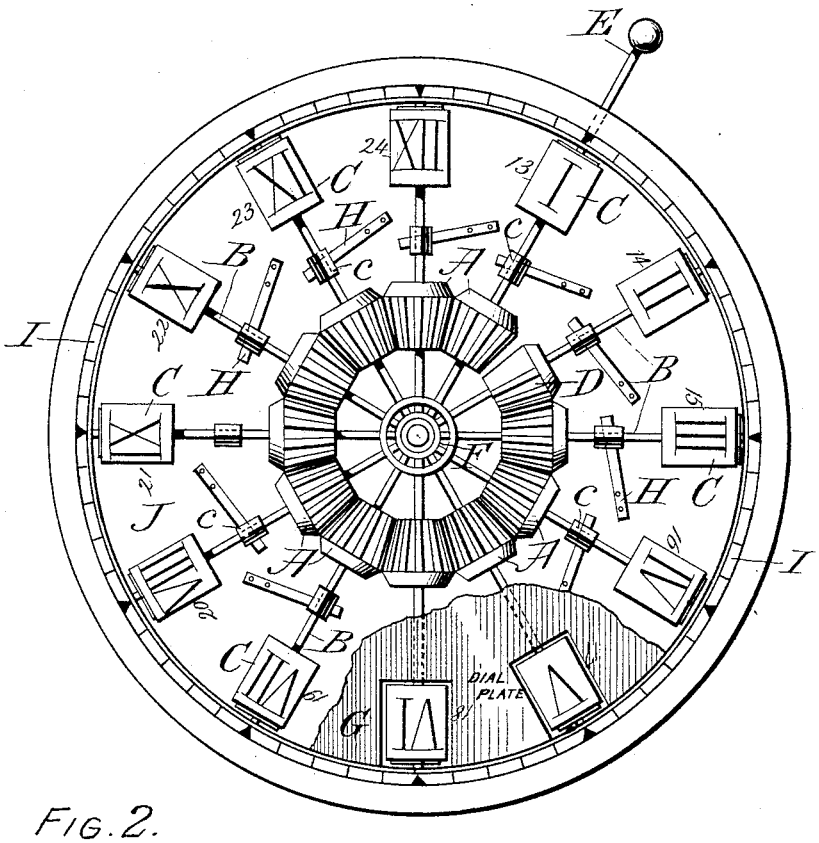



FIG. 2.

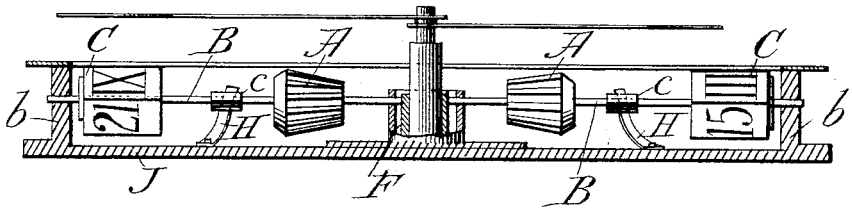
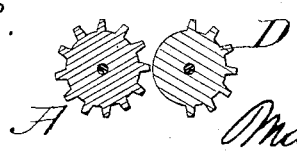



FIG. 3.

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# UNITED STATES PATENT OFFICE.

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## TIME-PIECE DIAL.

SPECIFICATION forming part of Letters Patent No. 347,337, dated August 17, 1886.

Application filed September 18, 1885. Serial No. 177,457. (No model.)

*To all whom it may concern:*

Be it known that I, MARTIN V. B. ETHRIDGE, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Time-Piece Dials; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to an improved and simple construction of the dial of time-pieces for designating time from one to twenty-four hours each day; and it consists in a construction and arrangement of parts to be manually operated, and particularly adapted for combination and use with watches wherein it is undesirable to disturb the delicate works by uniting with them any of the complicated mechanisms now in use for attaining like results with those contemplated by my present invention.

In the annexed drawings, illustrating my invention, Figure 1 is a view of a time-piece showing my invention applied thereto, and showing a portion of the dial-face broken away. Fig. 2 is a cross-section through that part of the watch where my improved dial is located, and Fig. 3 is a section through a mutilated beveled gear and a perfect beveled gear situated next to it.

Like letters designate like parts.

By reference to Fig. 1 it will be seen that my dial contains a circular series of rotary spindles, each of which is designated by a letter B. Each spindle B carries near its outer end a disk, block, or plate, C, of any suitable form, but preferably rectangular, in order to afford four sides for the delineation of numerals, and these numerals are to be so arranged that opposite faces of the same block will have the same numeral. Thus, as shown in Fig. 1, the block having Roman numeral "I" on one face will have "13" on each adjacent face, and "I" again on the opposite face. Block having "II" on one face will have "14" on each adjacent face, and "II" on the opposite face, &c. Of course, it is immaterial whether Roman and Arabic characters thus alternate, or whether Roman letters or Arabic numerals be each used exclusively. In addition to the block C, each spindle B, except one, carries a beveled gear, A, located near the inner end of the spindle at any suitable point. The one spindle thus excepted is to be provided with a mutilated gear, D, as shown in section in Fig. 3. This gear is so arranged that through half a revolution it will not engage with the neighboring gear on either side. Thus we have provided a circular series or pack of intermeshing beveled gears, excepting, of course, the mutilated gear D, which is situated similarly to all the rest in every respect but that of engaging two other gears, since it engages only one instead.

I denotes a circular rim or that portion of a dial-plate on which are delineated marks for the individual minutes. A dial-plate entire may or may not be used; but when used it must be perforated or provided with slots or openings located in the usual position of the twelve Roman numerals that are ordinarily delineated on the dials of the time-pieces. Where strict accuracy in the measurement of time is not essential, even the rim I may, perhaps, be dispensed with; but it will be generally most convenient to use this rim, although an entire dial may not be necessary.

G represents a portion of an entire dial-face, and serves to indicate how it may be perforated.

Behind the radial series of spindles and between it and the works of the watch is located a back plate, J. It is evident that in the case of a watch, for instance, all the works of the time-piece may be journaled into this back plate, J, so that there will be no need of having two plates in the watch—one in which to journal the watch mechanism and the other to complete the construction of the dial; but one plate will serve both purposes. Upon this back plate is situated a series of suitable bearings,

*b*, for supporting the outer ends of the spindles B, while the inner ends of the said spindles are journaled in a sleeve or collar, F, at the center of the watch, which loosely surrounds in the usual and ordinary way the thimble, &c., which drives the hands. One of the spindles, preferably the one next that part of the watch where the stem is situated, extends through the casing, and is provided with a knob or handle, E, by which it can be manipulated from left to right or from right to left. The mutilated gear D is in the drawings represented as being carried by the spindle located next the one which carries the knob E; but it is evident that this arrangement may be varied, and said gear D may be placed anywhere in the series, the object being to insure by means of it a break in what would be otherwise a continuous series of beveled gears, all interlocking with each other and effectually preventing any movement of the series.

Any suitable locking device may be provided for holding the spindles B in the desired position. For convenience I have illustrated one method, which consists in providing one of the spindles, preferably the one carrying the knob E, with a block, *c*, and also in attaching to the back plate, J, a spring, H, which may bear against said block *c* and hold it firmly.

In case it is desired to lock the device more firmly than could be done by a single spring of this sort, several of the spindles, or, in fact, all of them, may be provided in like manner with springs attached to the back plate; but it is evident that this construction may be departed from in whole or in part without departing from the spirit of my invention. By the arrangement thus described the rotation of the knob E will rotate the gears, and consequently all the blocks. Accordingly, by turning this knob a quarter of a revolution twice every twenty-four hours the figures may be changed after twelve o'clock so as to read from twelve to twenty-four and after twenty-four o'clock to read from one to twelve again. The alternate spindles will obviously rotate in opposite directions; but since the blocks have their opposite faces delineated with the same numeral no confusion will be occasioned by this arrangement. It will probably be found most convenient in actual practice to give the knob a quarter-turn forward at twelve o'clock, say, and a quarter-turn back at twenty-four o'clock, say. If other than a rectangular block be used, it will be necessary to regulate the extent of each turn accordingly.

By my invention herein described I am enabled to provide watches with a twenty-four-hour dial-plate easily and cheaply and without injuring or disturbing the delicate works and expensive movements of the watch, since it is not intended that my mechanism should be connected with the works of the watch or time-piece, but it is to be actuated by hand through the projecting knob E.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a time-piece, the combination, with a perforated dial-plate, of a series of radial spindles rotated manually by a knob, E, with which one of them is provided, each of said spindles carrying a block, C, and also a beveled gear, A, excepting one, which carries a mutilated gear, D, all of which gears intermesh, substantially as and for the purposes shown and described.

2. In a time-piece dial, a radial series of rotary spindles carrying blocks which designate the hours, and not connected with the works of the watch, but adapted to be operated by hand, substantially as shown and described.

3. In a time-piece, the combination of a perforated dial-plate and a radial series of rotary spindles, each but one carrying a beveled gear, A, and that one carrying a mutilated gear, D, each carrying also a numeral-block, C, on the faces of which are delineated numerals designating the twenty-four hours in each day, and each spindle being journaled in a bearing, *b*, and in a sleeve, F, the whole being arranged and adapted to be operated by hand in the manner substantially as shown and described.

4. In a time-piece, the combination of the rotary spindles B, provided with beveled gears A or mutilated gears D, which intermesh in a circular series, the sleeve F, bearings *b b*, and handle or knob E, affixed to one of the spindles, substantially as shown and described.

5. In a time-piece, the combination of the radial series of spindles B, provided with beveled gears A or mutilated gears D, and adapted to be operated by a knob, E, affixed to one of the spindles, and secured in position by any suitable locking device, as spring H and block *c*, substantially as shown and described.

6. In a time-piece, the combination, with a perforated dial-plate, of a radial series of spindles, B, carrying intermeshing gears A or D, and operated by a handle, E, secured in any desired position by a spring, H, bearing upon a block, *c*, mounted on the spindle, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

MARTIN V. B. ETHRIDGE.

Witnesses:

FRED E. TASKER,

CHAS. HALL ADAMS.