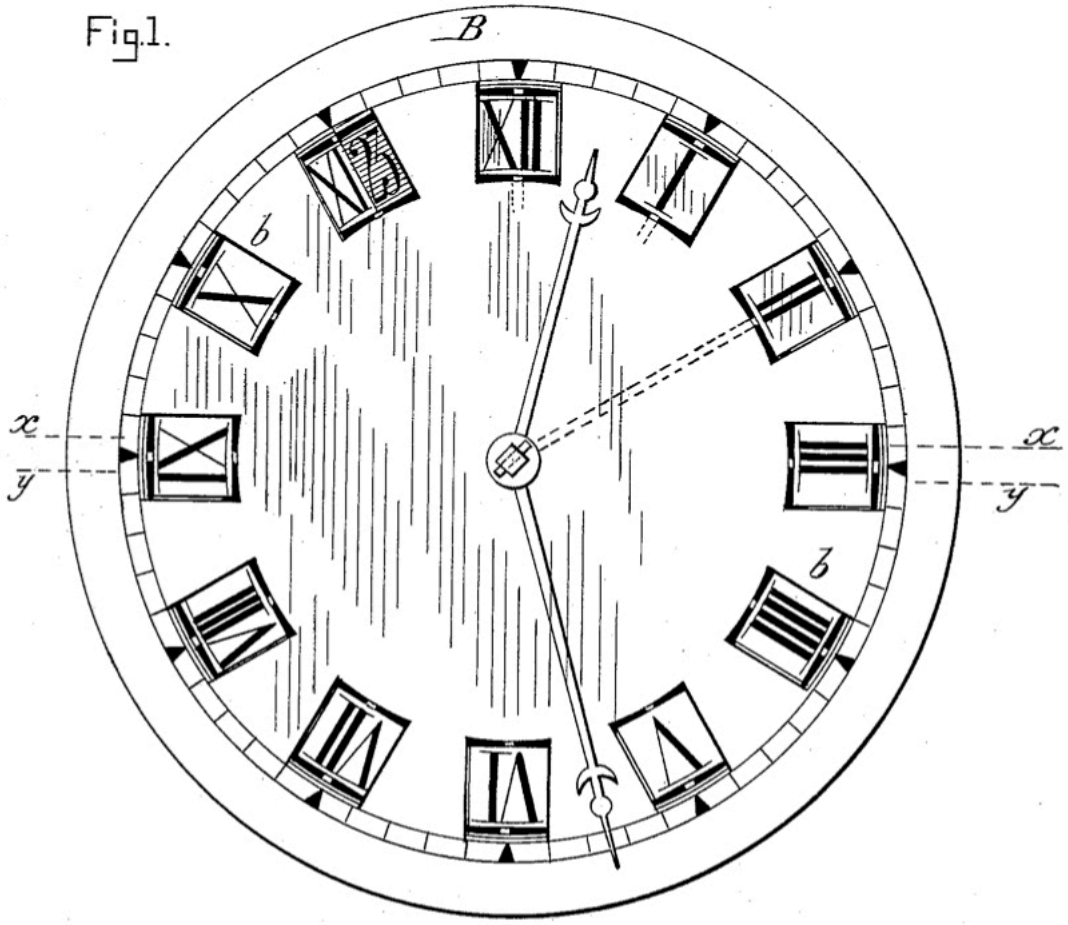
(No Model.) 2 Sheets—Sheet 1.

M. V. B. ETHRIDGE.

DIAL FOR TIME PIECES.

No. 319,804. Patented June 9, 1885.

Fig. 1.



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Fred. C. Tasker.

Inventor:
Martin V. B. Ethridge
by John C. Tasker atty

(No Model.) 2 Sheets—Sheet 2.

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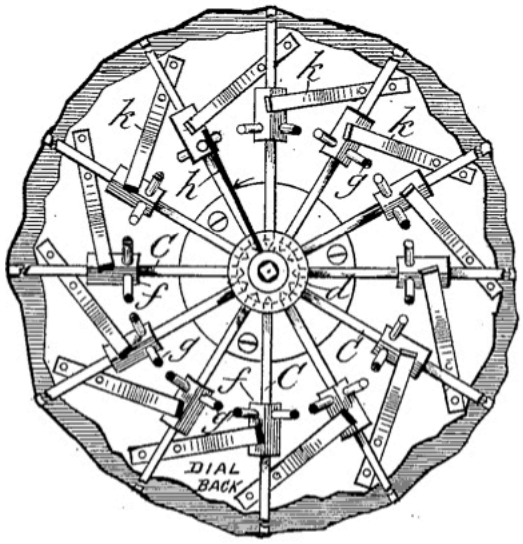


Fig. 2.

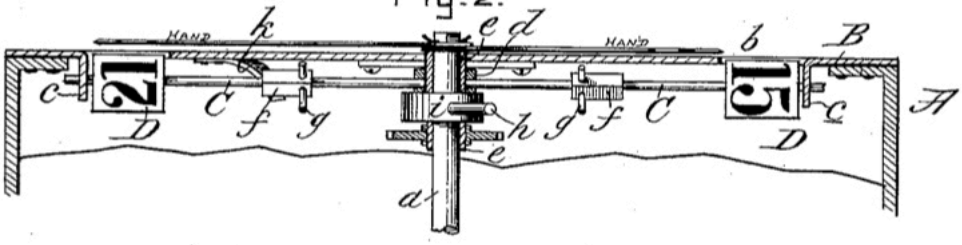


Fig. 3.

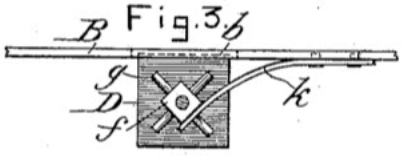
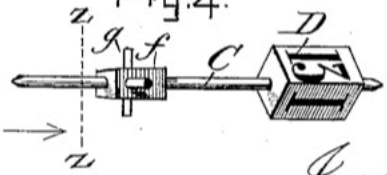


Fig. 4.



Witnesses.
A. R. Brown.
Fred E. Tasker.

Inventor.
Martin V. B. Ethridge
per John C. Tasker atty

UNITED STATES PATENT OFFICE.

MARTIN V. B. ETHRIDGE, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF TWO-THIRDS TO HENRY E. WAITE, OF SAME PLACE, AND JOHN SWANN, OF NEW YORK, N. Y.

DIAL FOR TIME-PIECES.

SPECIFICATION forming part of Letters Patent No. 319,804, dated June 9, 1885.

Application filed March 17, 1885. (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-Pieces; 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 time-pieces for designating time from one to twenty-four hours in each day.

The invention consists in the combination, with a perforated or slotted dial-plate, of a radial series of intermittently-rotary spindles, each carrying a block, plate, or disk, on the face of which are delineated numerals representing two of the twenty-four hours.

The invention also consists in the combination, with such spindles, of means for imparting a partial rotation to each consecutively during the revolution of the clock-hands, whereby each plate, disk, or block in succession is turned after the passage of the hour-hand, so as to display the proper numeral for correctly designating the hour when said hour-hand again passes that point.

The invention further consists of means for holding the spindles steadily in the position to which they may be turned, whereby the displayed faces of the respective numeral-blocks will rest in a plane parallel with the face of the dial, and opposite or within its several slots, so as to permit the time to be readily distinguished.

The invention is illustrated in the annexed drawings, in which Figure 1 is a view showing the face of the dial with its slots and the shifting numeral-blocks registering therewith. Fig. 1ª is a back view of the center of the dial. Fig. 2 is a transverse section in proper form between the lines *x y* of Fig. 1. Fig. 3 is a sectional detail view on the line *z z* of Fig. 4, with side view of a spring; and Fig. 4 is a perspective view of one of the rotary or shifting numeral-blocks and its spindles.

Like letters of reference designate like parts in the several views.

A denotes the front portion of a clock-case, and *a* is the shaft that carries the minute-hand. The dial-plate B is provided with slots or openings *b b*, located in the usual position of the twelve Roman numerals that are ordinarily delineated on the dials of time-pieces. On the rear or inner side of the dial-plate is a series of bearings, *c*, for supporting the outer ends of a radial series of spindles, C, the inner ends of which are journaled in a collar, *d*, which loosely surrounds the thimble *e*, that carries the hour-hand.

Each spindle C carries at or near its outer end a plate, disk, or block, D, that registers with one of the slots *b* in the dial-plate. These blocks D and slots *b* are preferably rectangular in form, though it is obvious that they may be made in any convenient shape. The spindles C also carry at or near the center a small quadrangular block or bearing, *f*, from each face of which projects a shoulder or pin, *g*, for engagement with a pin, *h*, that is carried by a disk or collar, *i*, on the hour-hand thimble. It will thus be seen that the hour-hand is followed in its revolution by the pin *h*, which by contact with the pins *g* successively rotates each spindle C, so as to turn the block D or shift its faces, after the hour-hand has passed, in such a manner as to display in succession on the several blocks the proper numerals for designating the hours correctly when the hour-hand again passes.

To the back of the dial-plate are secured a number of thin flat springs, *k k*, so arranged that each will bear against one of the faces of the block or bearing *f* on the several spindles, and so hold said spindles and attached numeral-blocks firmly in the position to which they may have been turned, as above explained.

The shifting or intermittently-rotary blocks D may each be four-sided, as shown in the drawings, and may carry two sets of numerals arranged on their several faces. Thus in the first block, I 13, I 13; second block, II 14, II 14; third block, III 15, III 15, and so on to the

twelfth block, which reads XII 24, XII 24. These numerals are preferably delineated as above in Roman and Arabic characters alternately on each block, the numerals from I to XII being in Roman characters, while those from 13 to 24 are Arabic. It is obvious, however, that all may be delineated in the same character or style, if desired. With a four-sided block, D, carrying numerals on each face, only one actuating-pin, *h*, is required, as the spindle C and block D require only a quarter-turn to conceal one numeral and display another. It will be understood, however, that instead of employing four-sided numeral blocks, I may use plates or disks having only two faces, said plates being successively marked on the opposite faces as follows: The first, I 13; second, II 14; fourth, IIII 16; ninth, IX 21; eleventh, XI 23, and so on. In this case the spindle C will require a half-revolution in order to conceal one numeral and display the other, and the disk or collar *i* will therefore have to carry two pins, *h*, arranged at a proper interval, each of which by bearing against the pins *g g* in turn will impart separately a quarter-revolution to the spindle, their joint action thus producing the desired effect.

The pin or pins *h*, as the case may be, will be arranged so as to follow the hour-hand at a suitable distance, and so shift each numeral block or plate after the hour-hand has passed, thus successively concealing the numerals already used, and displaying those required for indicating the time when the hour-hand again passes. Thus after the hour-hand has passed the numeral I the block or plate carrying said numeral will be shifted so as to display 13, and so on with each numeral-block in succession. In practice it is preferable to so arrange the pin or pins *h* with relation to the hour-hand as not to shift the several blocks until after the hour-hand has passed two or three numbers. It will be seen that after the spindles C and blocks D have been shifted they are held firm and square in line with the openings *b b* by means of the springs *k k*, so that there is no liability of their being disturbed until again acted on by the pin *h*, thus avoiding all danger of confusion in the proper succession of the numerals.

The hour and minute hands are actuated in the ordinary manner, there being no change whatever in the clock mechanism and no additions thereto, except to mount the pin-carrying disk or collar *i* upon the hour-hand thimble. My improvements can therefore be readily and cheaply applied to any ordinary clock now in use by providing a perforated dial-plate and mounting the shifting numeral-blocks and their supporting and actuating devices in its rear, as above explained.

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 intermittently rotated in a forward direction, each of said spindles carrying a block, plate, or disk, on the faces of which are delineated numerals designating the twenty-four hours in each day, substantially as described.

2. In a time-piece, the combination of a perforated dial-plate, a radial series of intermittently-rotary spindles, each carrying a numeral-block and provided with a bearing, as *f*, having pins *g g*, and a carrying disk or collar, *i*, mounted on the hour-hand thimble, and having a pin, *h*, thereon, substantially as described.

3. In a time-piece, the combination of a dial-plate having slots or openings *b b* and supporting-springs *k k*, a radial series of intermittently-rotary spindles, C, carrying numeral blocks or plates D, and having bearings *f*, provided with pins *g g*, and a disk or collar, *i*, mounted on the hour-hand thimble *e*, and carrying a pin, *h*, substantially as described.

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

MARTIN V. B. ETHRIDGE.

Witnesses:

STEPHEN W. TROWBRIDGE,

CHAS. HALL ADAMS.