

(No Model.)

M. V. B. ETHRIDGE.

TIME PIECE DIAL.

No. 395,696.

Patented Jan. 8, 1889.

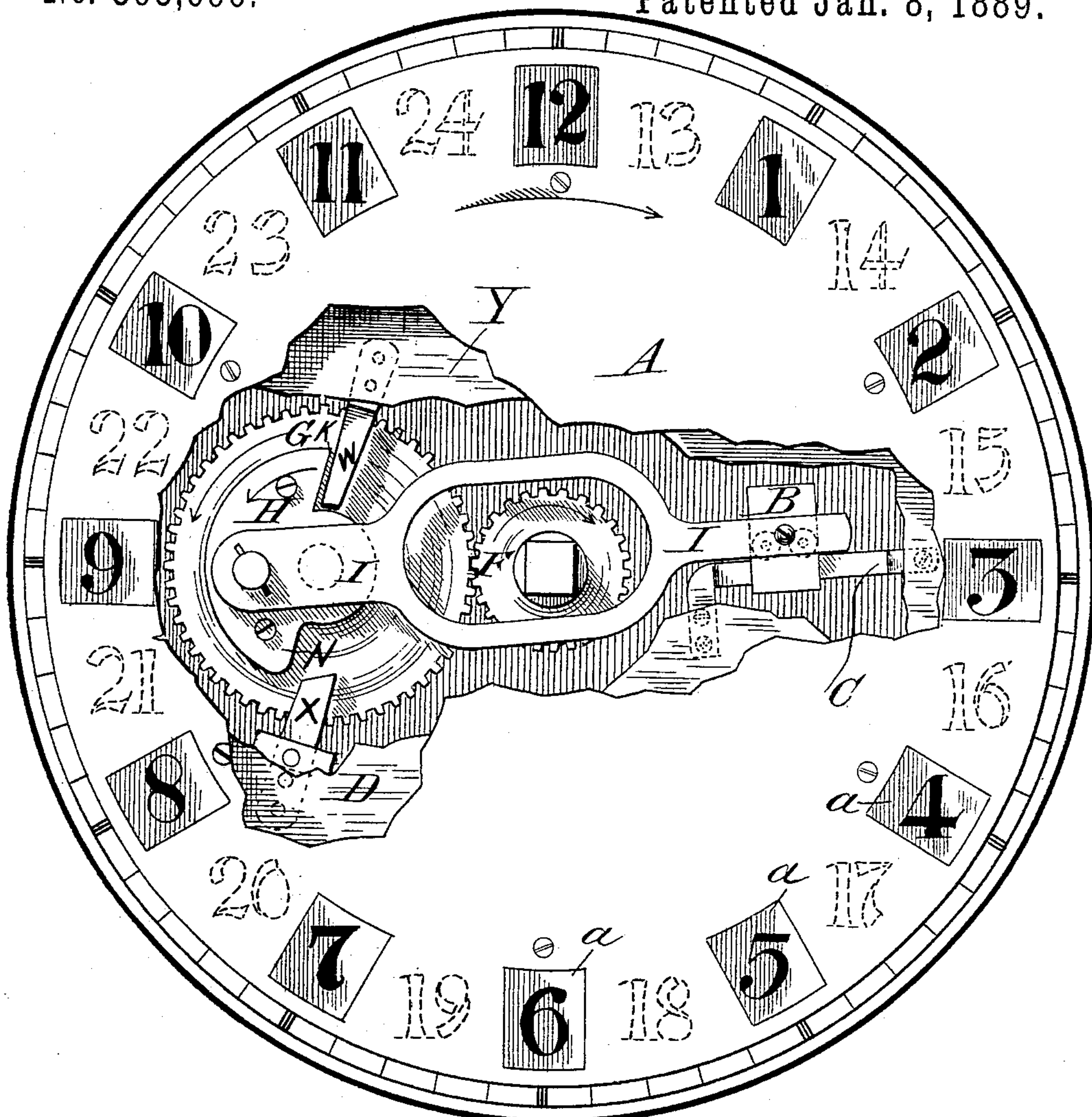


Fig. 1.

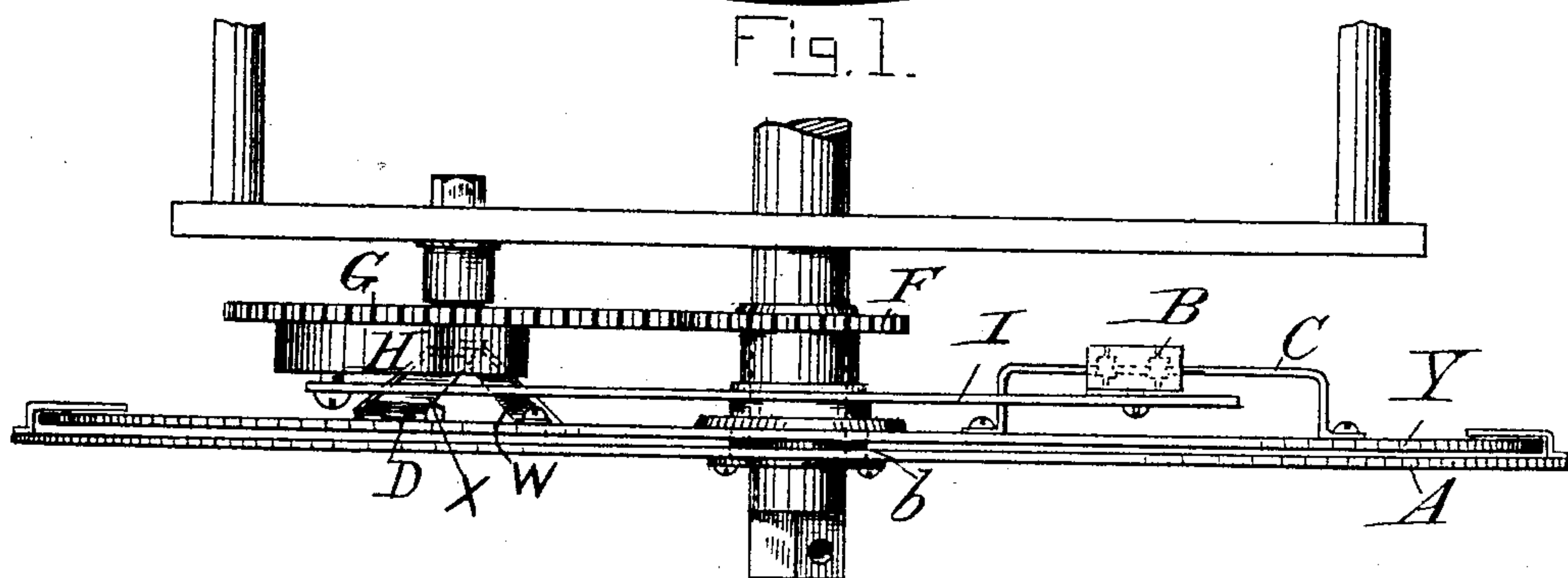


Fig. 2.

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

TIME-PIECE DIAL.

SPECIFICATION forming part of Letters Patent No. 395,696, dated January 8, 1889.

Application filed January 18, 1888. Serial No. 261,080. (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 hereby 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.

This invention pertains to time-keepers of whatever kind, class, or name, it being applicable to clocks, watches, chronometers, and all analogous devices.

The object of the invention is to facilitate the observation of time according to that system which reckons the twenty-four hours of the day from one up to twenty-four, continuously. It embraces mechanism for automatically shifting or imparting a partial rotation to the inner one of two dial-plates, of which the outer is provided with twelve equidistant slots or openings, while the inner has delineated thereon the numerals, which are displayed to view through said slots or openings, in the manner to be hereinafter stated.

The invention further includes certain details in the structure, combination, and arrangement of the mechanical parts, substantially as will be hereinafter described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a face view or front view of a time-piece with a portion of the outer and inner dial-plates broken away, as shown, so as to clearly represent my improved mechanism for automatically shifting the inner dial. Fig. 2 is a top plan view showing the same parts.

Similar letters of reference designate corresponding parts in both views.

A denotes the outer or front dial, or part which occupies the place of the ordinary dial. This dial is stationary. It is provided with slots or openings *a a*, arranged in a circular series near the circumference, said slots or openings being uniformly spaced and sized and equidistant from each other, and located in the usual position of the twelve numerals

that are ordinarily marked on the dials of time-pieces. The slots or openings *a a* may be of any shape and size desired, their purpose and function being to display through them numerals which are marked on the inner dial. Furthermore, it may be remarked that the outer dial-plate, A, may be variously constructed, it being only essential that it shall cover and conceal certain of the figures upon the inner dial while it is permitting others of these figures to be visible.

Behind the outer dial a second inner dial-plate, Y, is suitably mounted, so as to be capable of turning or oscillating upon its center.

A preferable mode of supporting this dial is to loosely mount it on the collar *b*, which surrounds the hour-hand sleeve. Upon the face of the inner dial, Y, is printed or otherwise produced a set of figures running from 1 to 12, consecutively, said figures being so arranged that when the dial is in one position these figures will be exhibited through the openings *a* in the outer plate. Another set of figures, running from 13 to 24, are likewise indicated upon the plate Y, said second series of figures being arranged in intermediate positions between the members of the first series, as will be perceived by inspection of Fig. 1, where the series of figures from 1 to 12 are shown in full lines, in plain view, through the apertures in the outer dial, while the series of figures from 13 to 24 are shown in dotted lines, the position of the dial being such at this time that the second series of figures are concealed beneath the outer plate. Thus it will be readily apparent, without further amplifying the description of these parts, that when the inner dial occupies one position the series of figures from 1 to 12 will be observed, while when it has been shifted to occupy another position the series of figures from 13 to 24 may be apparent. The shifting of the dial will therefore be by a forward and backward movement within narrow extremes, for the amount of turning motion requisite for the inner dial to accomplish its oscillation will be about one twenty-fourth of a revolution.

I will now describe the mechanism whereby the inner dial is automatically oscillated at

the end of each half day, shifting the dial-plate forward in the direction indicated by the arrow at one oscillation and in the reverse direction at its next oscillation.

5 A rod, C, bent into a loop shape, substantially like that shown in Fig. 2, so that it may have a portion to serve as a slide for the weight B, is attached to the rear side of the inner dial-plate, Y, and is located to the right
10 of the central support of said dial. Likewise, firmly secured to the inner dial, are arms X and W. These arms project outwardly from the dial, as shown in Fig. 2, and are properly positioned with respect to the adjacent parts,
15 as I shall presently more particularly specify. They are on the opposite side of the center of the dial to that where the rod C is placed. On the same side of the supporting-point of the dial Y a weight, D, is carried thereby. I
20 preferably locate this weight in juxtaposition to the arm X, as will be seen at D, Fig. 1; but it may be stationed at a different point, if desired.

A gear, F, is fixed to the hour-hand sleeve
25 so as to revolve therewith once in twelve hours. This gear meshes with a larger gear, G, which revolves once in twenty-four hours. To the gear G is secured a cam, H. The shape of the cam is shown in Fig. 1. It has a curved outline which is parallel to the circumference of the gear G, said outline terminating in an upper point, K, and a lower point, N, the lower point being opposite to the upper and beneath it when the gear is in the position shown.
30 The points K and N of the cam, in addition to being connected by the symmetrically-curved outline thereof just referred to, are also connected by an irregular outline on the other edge of the cam. The cam H rotates in contact with the ends of the arms X and W. A
40 connecting-rod, I, extends between the cam H and the sliding weight B on the rod C, said connecting-rod being pivoted to both cam and weight. It is preferably of the form shown,
45 comprising a sort of frame that incloses the hour-hand sleeve.

Various modifications in the forms and proportions and in the relative positions of the various mechanical elements hereinabove recited may doubtless be made within wide limits without departing from the spirit of this invention, and a considerable rearrangement of the parts may perhaps be found preferable and convenient in adapting the invention to
50 actual practice with clocks and other time-keepers of various sizes and styles. I therefore would not confine myself strictly to the details of construction that I have described, but reserve the liberty of making such changes
60 as will not sacrifice the advantages of the invention, and which will be in harmony with the obvious intent and scope of the claims hereinafter formulated.

I have now described the essential features
65 of mechanical construction. The operation of these elements in accomplishing the results in view will now be set forth.

Suppose the parts to be in the position shown in Fig. 1. Here the numerals from 1 to 12 are exposed to view. The mechanism that
70 shifts the dial is so situated that the weight B has been drawn toward the support of the inner dial, so that it occupies its position nearest to said support, and the cam H has rotated to the place where the point K of the
75 cam has been removed from contact with the end of the arm W, thus permitting the latter to drop, because the weight D, being secured to the dial on one side of the support of the same, is heavier than the dial on the opposite
80 side of the center, which side carries the weight B; hence the side of the dial carrying the weight D overbalances the opposite side. If now the cam continues its rotation in the direction denoted by the arrow, the point N
85 will immediately come in contact with the end of the arm X, and the curved outline of the cam will ride upon the arm X until point K has reached and dropped off the said arm X. All the while that the arm X is riding
90 upon the curved portion of the cam said arm will be held against the cam and prevented from rising, even though the weight B has, in consequence of the continued rotation of the cam and the movement of the connect-
95 ing-rod, been pushed so far away from the central support of the inner dial as to overbalance the weight D; but when the point K ceases to be in contact with the arm X then the weight B will be permitted to drop, which
100 will cause the dial to rotate and the figures from 13 to 24 to be brought into view, while the other series from 1 to 12 is covered. As the weight B falls, obviously the arm X will rise, and likewise the arm W will be elevated,
105 since the arms X and W are relatively stationary, being both secured to the inner dial. The cam will continue its rotation therefore; but this time it will serve to uphold the arm W and station the dial in the position to
110 which it was previously rotated (even though the weight B slides toward the central support of the dial) until the position of the parts, as shown in Fig. 1, is again resumed and the point K drops off the arm W, allow-
115 ing the heavier side of the dial to overbalance the lighter and shift it back into the position where the figures from 1 to 12 are shown.

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

1. In a time-piece, the combination, with a shifting inner dial, of relatively-adjustable weights carried thereby on opposite sides of
125 the central support of said dial and mechanical devices for adjusting the weights, consisting of a cam acting on projecting points on the dial, a connection between the cam and the weight on the opposite side of the dial-
130 center, and actuating-gearing for the cam, substantially as described.

2. In a time-piece, the combination, with a shifting inner dial, of weights carried thereby

on opposite sides of the dial-center, one of said weights being normally stationary, while the other is adjustable between points where it will and will not overbalance the other, and
5 mechanical devices for adjusting the movable weight, all arranged to operate substantially as described.

3. In a time-piece, the combination of an apertured outer dial, a shifting inner dial, a
10 sliding weight carried by a rod fixed to the inner dial on one side of its center, a stationary weight and projecting arms affixed to the dial on the opposite side of its center, a rota-
15 tive cam acting on the projecting arms, a connecting-rod between the cam and the sliding

weight, and actuating-gearing for the cam, all arranged to operate as set forth.

4. The combination of the inner dial, Y, the rod C, secured thereto and carrying weight B, the weight and arms X and W, like- 20
wise secured to the dial on the opposite side of the dial-center, the gear G, cam H, attached to said gear, connecting-rod I, and actuating-gear F, substantially as described.

In testimony whereof I affix my signature in 25
presence of two witnesses.

MARTIN V. B. ETHRIDGE.

Witnesses:

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CHAS. HALL ADAMS.