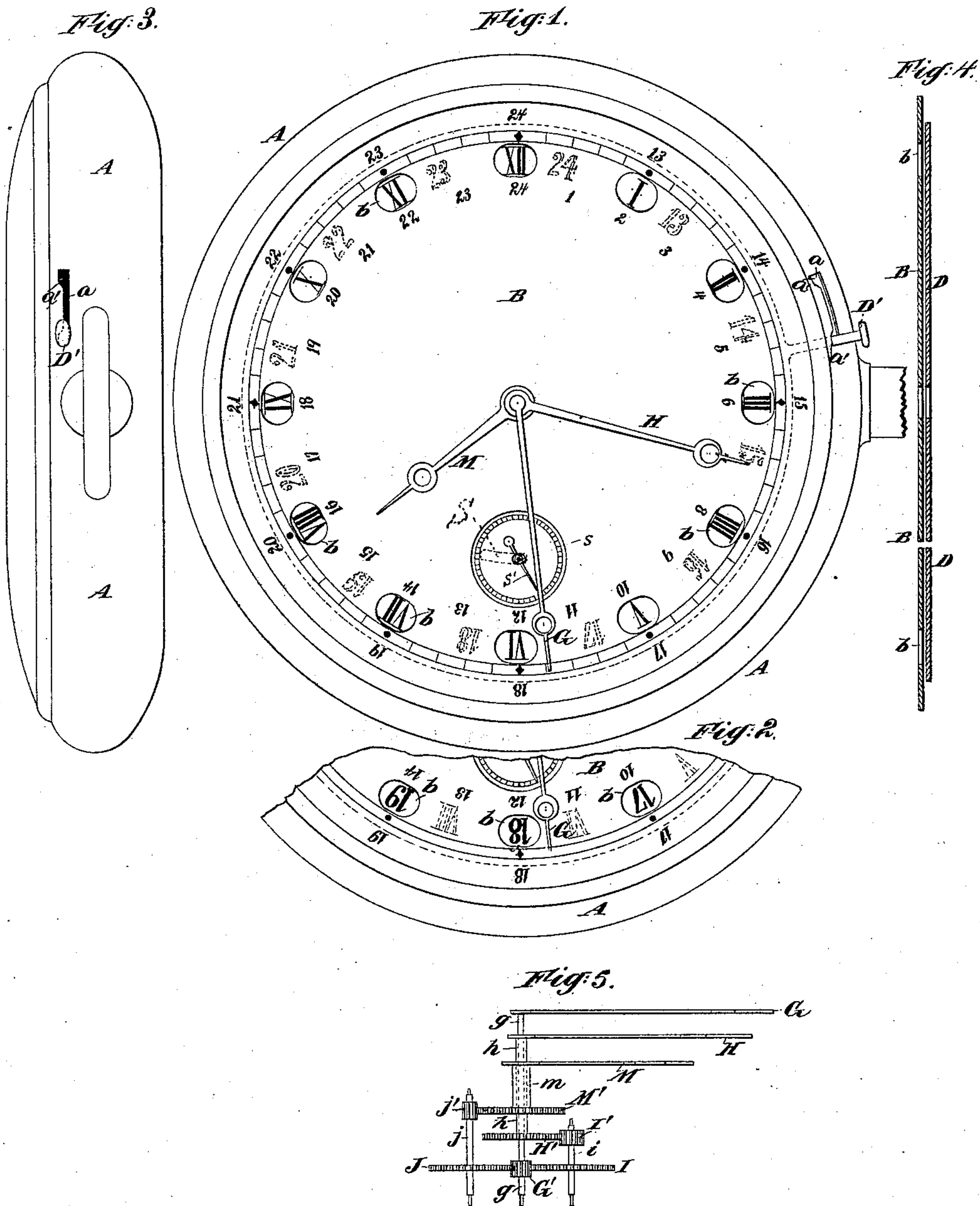


(No Model.)

W. J. GAGE.
SHIFTING DIAL FOR TIME PIECES.

No. 303,145.

Patented Aug. 5, 1884.



WITNESSES—
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UNITED STATES PATENT OFFICE.

WILLIAM J. GAGE, OF NEW YORK, N. Y.

SHIFTING DIAL FOR TIME-PIECES.

SPECIFICATION forming part of Letters Patent No. 303,145, dated August 5, 1884.

Application filed November 21, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. GAGE, of New York city, in the State of New York, have invented certain new and useful Improvements in Clocks and Watches, of which the following is a specification.

The object of the invention is to facilitate the observation of time according to the system of reckoning the twenty-four hours of a day from one up to twenty-four continuously. In what I esteem the most complete form of the invention, the clock or watch will also indicate time by the ordinary system of reckoning the time by hours up to twelve, consecutively, and then repeating to complete the twenty-four.

The invention may be applied to clocks, watches, chronometers, and analogous devices, of whatever name, including tower-clocks. I will describe it as applied to a watch. The subject of reckoning the hours continuously, either from midnight around to midnight again, or from noon around to noon again, has been much agitated of late in connection with railroad time-tables. My invention will greatly promote the convenience of those unaccustomed to the system, and will diminish the risk of occasional serious mistakes by those who may be usually successful in mentally calculating the proper hour from the ordinary dial.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is a face view or front view of the watch. Fig. 2 is a corresponding view of a portion showing another set of figures. Fig. 3 is a side elevation. Fig. 4 is a section of the dial. Fig. 5 is a side elevation showing the mechanism for driving the third hand.

Similar letters of reference indicate corresponding parts in all the figures.

The drawings represent the novel parts, with so much of the ordinary parts as is necessary to indicate their relation thereto. It will be understood that the parts not represented may be of the ordinary and long-approved construction.

A is the case, of any ordinary or suitable pattern, and B the face, or the part which oc-

cupies the place of the ordinary dial. It will be understood that there is the ordinary glass "crystal" (not represented) in front of the face. There may be a hinged cover of metal in front of that, constituting the case—a hunting-case, if desired. At the twelve equidistant points on the dial, where the ordinary figures are located to indicate the hours, I make simply uniformly-spaced apertures *b*, preferably round, or nearly so.

D is a dial mounted behind the front dial, B, and capable of turning a little on its center, controlled by an arm, *D'*, which extends out through a slot, *a*, in the case A, and can be shifted at will from one extremity to the other of the slot. The amount of turning motion thus induced is one twenty-fourth of a revolution. The stem *s* of the second-hand *s'* projects through both dials D and B, and to provide for the required oscillation of the dial D the said dial is formed with a curved slot, *S*, as shown in dotted lines in Fig. 1, the curvature of said slot corresponding to the axis of motion of said dial D. A series of ordinary figures, running from 1 up to 12, are printed or otherwise produced on the movable dial D. These are so arranged that when the dial D is in one position these ordinary figures are exhibited through the openings *a*. This condition obtains in Fig. 1. Another set of figures, running from 13 up to 24, are printed or otherwise produced on the same dial, D, and in intermediate positions between the ordinary figures. The arrangement is such that when the arm *D'* is shifted into the other extremity of the slot *a* all the ordinary figures are concealed, and the figures ranging from 13 to 24 are exhibited through the apertures *b*. This condition obtains in Fig. 2. The ordinary hands of the watch are indicated by G and H, G being the minute-hand and H the hour-hand. They are driven by the works of the watch in the ordinary manner, and sustain their ordinary relations to each other and to the dial; but by the provisions for changing the dial the hour-hand indicates either a figure in the first series from 1 to 12 or the corresponding figure in the second series from 13 to 24, at the will of the user, according as he shall place the arm *D'* and correspondingly hold the rear dial, D. The slot *a* is made with

a beveled notch, a' , at each end. The parts are so bent or otherwise conditioned that the arm D' , and preferably the adjacent portion or the whole of the rear dial, D , springs forward with considerable force, thus tending to hold the arm D' in whichever notch a' it may be placed. When it is desired to shift it, the operator, applying his thumb on the arm D' , presses it gently backward and then turns it into the other end of the slot, where, on being released, its elasticity engages it in the notch a' at that end. The notches a' hold it reliably against being disturbed by the ordinary carrying of the watch. On the front dial, immediately exterior to the apertures b , I produce figures from 13 up to 24. These are always in sight, and may serve to aid the mind in determining which position corresponds to those numbers when the ordinary figures, 1 to 12, are shown in the spaces b , without requiring the shifting of the rear dial.

In what I esteem the most complete form of the invention an additional hand is employed, making only one complete circuit in twenty-four hours. I also produce on the front face, B , a corresponding series of figures extending in uniformly-spaced positions once around the dial. I have here represented this continuous series as close within the circle of apertures b . It may be at a greater distance within, or it may be without, if preferred.

M is the third hand. It is mounted on a sleeve, m , driven by what is known as "intermediate gearing" from the shaft of the minute-hand, in the same manner as the ordinary hour-hand, H , is driven from the minute-hand, but by a different counter-shaft, and having the gear differently proportioned. The cannon-pinion G' is fixed firmly on the shaft g of the minute-hand. This gears into a large toothed wheel, I , on the shaft i . A pinion, I' , fixed on the same shaft engages with a large gear-wheel, H' , on the sleeve h , which carries the hour-hand H . The intermediate gearing which drives the hand M is shown on the other side of the same figure. The same cannon-pinion, G' , engages also with a large gear-wheel, J , fixed on the shaft j . A pinion, j' , on this shaft engages with a large gear-wheel, M' , on the sleeve m . The latter sleeve carries the twenty-four-hour hand M . It will be understood that the shaft g of the minute-hand is turned with a reliable motion by the ordi-

nary train of gearing. (Not represented.) It may be operated by an ordinary mainspring and regulated by an ordinary escapement.

Modifications may be made in the forms and proportions within wide limits. The size and form of each aperture b may be widely varied. I believe it practicable to change the position of the movable dial D by the proper machinery operated by the watch or clock holding it in one position twelve hours, and then shifting it rapidly to the other extreme position and holding it there twelve hours. Such would involve a large addition to the mechanism, and I prefer the provisions for changing by hand, as shown.

I am aware that stationary disks having apertures through which different figures upon a movable disk placed behind it have been before used as counting devices, as shown in English Patent No. 404 of 1854. Such construction is not sought to be covered in this application.

What I claim as new is—

1. In a clock, substantially as described, having a second-hand attachment, the combination, with the stationary dial having apertures, as b , and with the second-shaft s , of the movable dial D , having different sets of figures, and having also the curve slot S , and means for moving said dial and for locking it in either of two positions, as shown, and for the purposes set forth.

2. The clock herein described, consisting, essentially, of the compound train of gearing, the spindles g s , the hands M , H , G , and s' , the stationary dial having apertures b , a circle of figures from 1 to 24, inclusive, and a row of figures from 13 to 24 corresponding with the said apertures, and a movable dial, D , having two sets of figures in different characters, the slot S , which receives the shaft s and handle D' , and the frame A , having locking-slot a a' , all combined and arranged to serve as and for the purposes set forth.

In testimony whereof I have hereunto set my hand, at New York city, New York, this 29th day of October, 1883, in the presence of two subscribing witnesses.

WM. J. GAGE.

Witnesses:

J. BUCKLEY,
A. J. MASON.