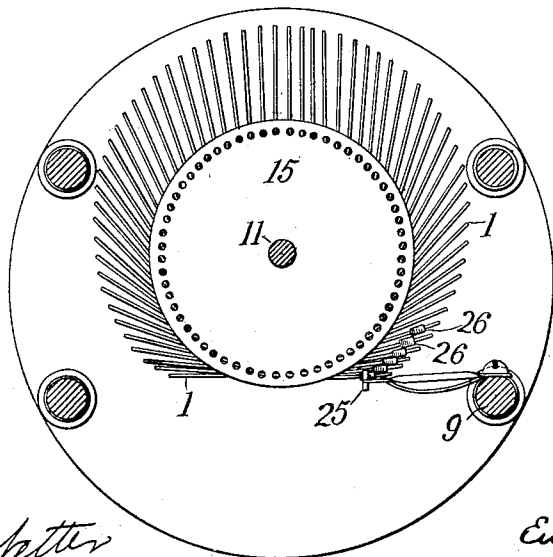
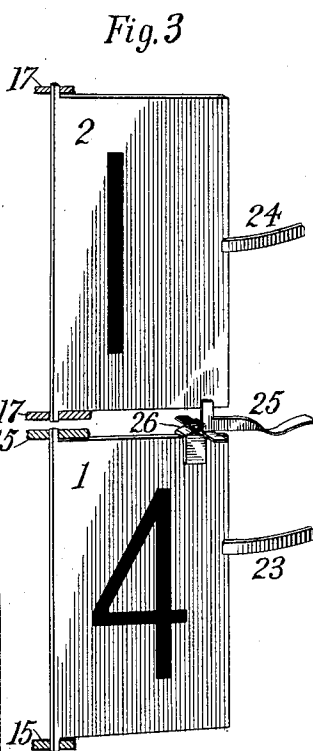
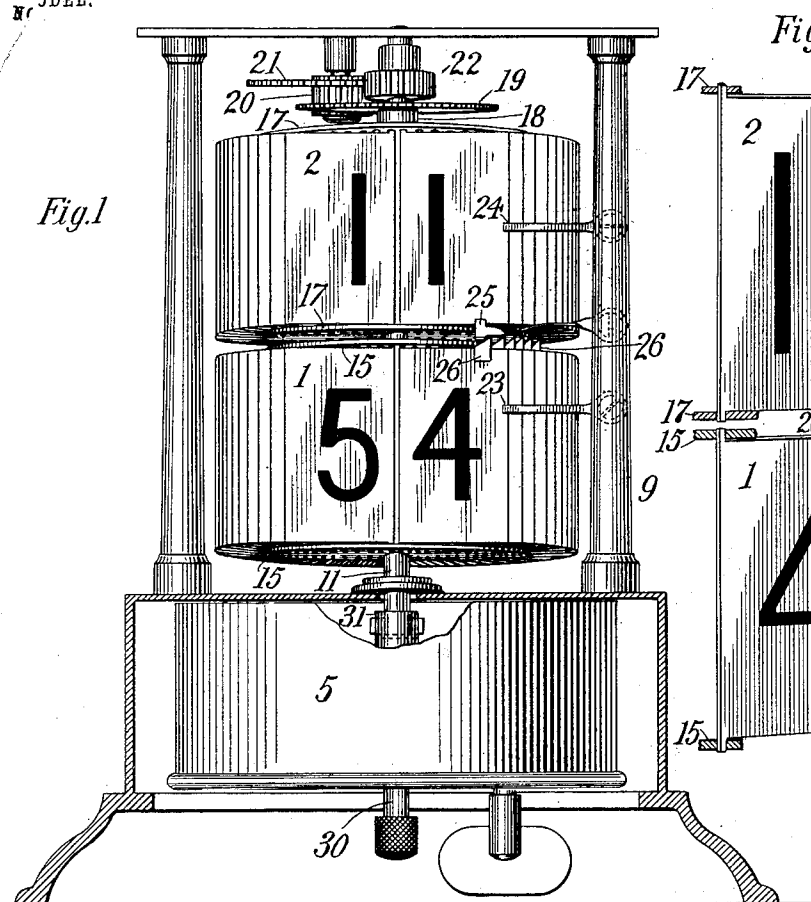


E. FITCH.
CLOCK.

APPLICATION FILED APR. 16, 1903.

MODEL.



Witnesses:

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UNITED STATES PATENT OFFICE.

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EUGENE FITCH, OF NEW YORK, N. Y.

CLOCK.

SPECIFICATION forming part of Letters Patent No. 733,180, dated July 7, 1903.

Application filed April 16, 1903. Serial No. 152,931. (No model.)

To all whom it may concern:

Be it known that I, EUGENE FITCH, a citizen of the United States, residing at the borough of Manhattan, in the city of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Time-Indicators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to time-indicators or clocks or indicating devices in which plates or leaves are successively exhibited, and has for its objects the prevention of false indications, the control of the change of indication of one set of plates by the change of indication of another set of plates, and ease of adjustment and simplicity of the construction of such indicators. In such indicators it is of great importance that the several sets of time-indicating plates shall change their indications in harmony one with another—as, for example, with hour-indicating plates combined with minute-indicating plates, as in the construction hereinafter described—that the change of the hour indication at the hour-plates shall occur at exactly the same time as the change of the minute indication arranged to correspond therewith. Where the hour indication is changed at the even hour, this change should occur simultaneously with the change of the minute indication from fifty-nine minutes to the even hour. Should either set of plates change its hour indication in advance of the other, the indication will be one hour wrong until both sets of plates have passed their hour indication. It has heretofore been exceedingly difficult and practically impossible within the range of commercially-practicable accuracy of construction to simultaneously effect these changes of both sets of plates at every change of the hour indication, and this fault has constituted a serious objection to indicators of this class. According to my invention I reliably effect this simultaneous change of indication by controlling the movement of plates of one set, as the hour-plates, by plates of another set, as the minute-plates, so that with hour and minute plates one or more minute-plates will control each hour-plate in advance of and until the proper time for the change of indication of the hour-plate and will prevent

the change of indication of the hour-plate until the proper change of indication of the minute-plates has occurred, thereby permitting a variation in the accuracy of the hour-plate actuating and controlling parts as great as the interval covered by the number of minute-plates controlling the hour-plate without possibility of a false or erroneous indication.

I will now describe the construction of time-indicator embodying my invention which is illustrated in the accompanying drawings and will thereafter point out my invention in claims.

Figure 1 is a front elevation of the indicator with its base partly broken away. Fig. 2 is a section of the same on a nearly-horizontal plane just above the top of the minute-indicating rotating part. Fig. 3 is an enlarged perspective view of the advance plates whose front faces are exhibited and of the controlling device.

In the indicator shown in the drawings there are two series of indicating-plates, the plates 2 of the upper series of plates indicating the hours and the plates 1 of the lower series of plates indicating the minutes past the hour from each hour to the next hour. These indicating-plates are freely pivoted at their inner edges in plate-carrying rotating parts comprising the pair of disks 17 for the hour-plates and the pair of disks 15 for the minute-plates, and the disks 15 of the minute-plates are fixed upon the main spindle 11, this main spindle 11 receiving motion from the minute-spindle 30 of a clockwork located within the casing 5 through a clutch 31 and being practically a continuation of the minute-spindle. The main spindle 11 is slightly inclined upward and rearward, and there is sufficient freedom in the clutch 31 to permit the minute-spindle to be arranged vertically. The hour-disks are carried on a sleeve 18, fitted to rotate on the main spindle 11 and connected to the main spindle by hour-reducing gears 19 20 21 22. The indicating-plates are individually controlled by spring-stops 24 for the hour-plates, and 23 for the minute-plates, each stop pressing the front plate of its series of plates back upon the adjacent plates in rear sufficiently to develop a resilient force which will cause the front plate as

it moves clear of the stop to be swung on its pivot to the position in which its rear face will be exposed. These stops 23 and 24 are in the form of light springs suitably secured to the post or column 9. The control of the hour-plates by the minute-plates is effected through an additional stop 25 for the hour-plates, and, as shown, controllers 26 are provided on six of the minute-indicating plates 1, which control the movement of the additional stop 25, so as to cause it to hold an hour-plate from the engagement of the first controller 26 with the additional stop 25 until the last minute-plate carrying a controller 26 has been released. As shown, the first minute-plate carrying a controller 26 is that which is held by the minute-plate stop 23 in exposed position to give the indication of fifty-four minutes, and the last minute-plate carrying a controller is therefore the minute-plate which is thus held for the indication of fifty-nine minutes. Should the hour-plate stop 24 release the hour-plate at any time during this interval of six minutes, the hour-plate will nevertheless be held by the additional stop 25 until the minute-plates change the indication from fifty-nine minutes to the even hour. This range of control is usually more than sufficient to provide for the ordinary variations in the release of the hour-plates by the hour-plate stop 24; but a greater or less number of minute-plates may be provided with controllers 26 for hour-plates. A single controller would cover the interval of one minute, and the number of controllers could be increased to the limit of avoiding engagement with the next hour-plate in advance. In the construction shown, as in my prior patents, Nos. 715,776 and 724,460, there are sixty hour-plates, five for each hour, and the hour-plates are changed at intervals of twelve minutes, and during this interval twelve minute-plates are changed.

The additional stop 25 is shown as a spring suitably secured to the post 9 and flexible horizontally and vertically. The upper portion of its engaging end has an upward projection of sufficient width to engage the hour-plate, and the stop is normally out of engaging position, so that its upward projection will only be interposed in the path of the hour-plates when the stop is engaged by a controller on a minute-plate. The lower portion of the engaging end of the additional stop 25 is shown as a horizontal contact bar or shoe of sufficient length to bridge from one minute-plate to the next, so that before the additional stop is released from the controller 26 of one minute-plate it will be engaged by the controller 26 of the succeeding minute-plate, and will thus be held in engaging position until the last minute-plate provided with a controller 26 has been released. The controllers 26 of the minute-plates are shown as projections having inclined upper surfaces, so as to push the additional stop upward by contact of these inclined upper sur-

faces therewith. The first controller 26 has to move the additional stop from its normal position up into position to engage with the front hour-plate. The other controllers continue this engaging position of the additional stop and have inclined upper surfaces, so as to avoid extreme accuracy of adjustment, and for convenience of manufacture all of the controllers may be of the same shape, as shown.

It is obvious that various modifications may be made in the construction shown and above particularly described within the spirit and scope of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. The combination, with a plurality of sets of indicating-plates and means for actuating and controlling the plates, of a stop for the plates of one set, controlled by one or more plates of another set.

2. The combination with a plurality of sets of indicating-plates and actuating and controlling means therefor, the plates of one set indicating smaller intervals of time than the plates of another set, of means for controlling the plates indicating the greater intervals by one or more plates indicating the lesser intervals.

3. The combination with a plurality of sets of indicating-plates and actuating and controlling means therefor, the plates of one set indicating smaller intervals of time than the plates of another set, of a stop for the plates indicating the greater intervals, and a controller or controllers for such stop on one or more of the plates indicating the lesser intervals.

4. The combination, with a plurality of sets of indicating-plates and means for actuating and controlling the plates so that those of one set are more frequently changed than those of another set, of a stop for the less frequently changed plates, such stop being normally out of engaging position, and a controller or controllers on one or more of the more frequently changed plates adapted to move and hold the stop in engaging position.

5. The combination, with minute-indicating plates and hour-indicating plates and means for causing the same to be exhibited, of a stop for the hour-plates controlled by minute-plates.

6. The combination, with minute-indicating plates and hour-indicating plates and means for causing the same to be exhibited, of a stop for the hour-plates, such stop being normally out of engaging position, and controllers on the minute-plates adapted to move and to hold the stop in engaging position.

7. The combination, with a plurality of sets of indicating-plates and means for actuating the plates, of stops for the plates of the different sets, and an additional stop controlled by one or more plates of one set and controlling plates of another set.

8. The combination, with a plurality of sets of indicating-plates and means for actuating and controlling the plates, of a resilient stop for plates of one set, such stop being normally out of engaging position, and a controller for such stop, such controller being on a plate of another set and the stop and controller having an inclined engagement.

9. The combination, with minute-indicating plates and hour-indicating plates and actuating means therefor, of resilient stops for the minute-plates and hour-plates, an additional resilient stop for the hour-plate, and a controller or controllers on one or more minute-plates and controlling such additional stop.

10. The combination of minute-indicating plates and hour-indicating plates, an actuating-clockwork, resilient stops for the minute-plates, an additional resilient stop for the hour-plate normally out of engaging position, and controllers on minute-plates for such additional stop, each of such controllers having an inclined upper surface and the additional stop having a shoe adapted to engage the controllers, substantially as set forth.

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

EUGENE FITCH.

Witnesses:

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WALTER L. BUNNELL.