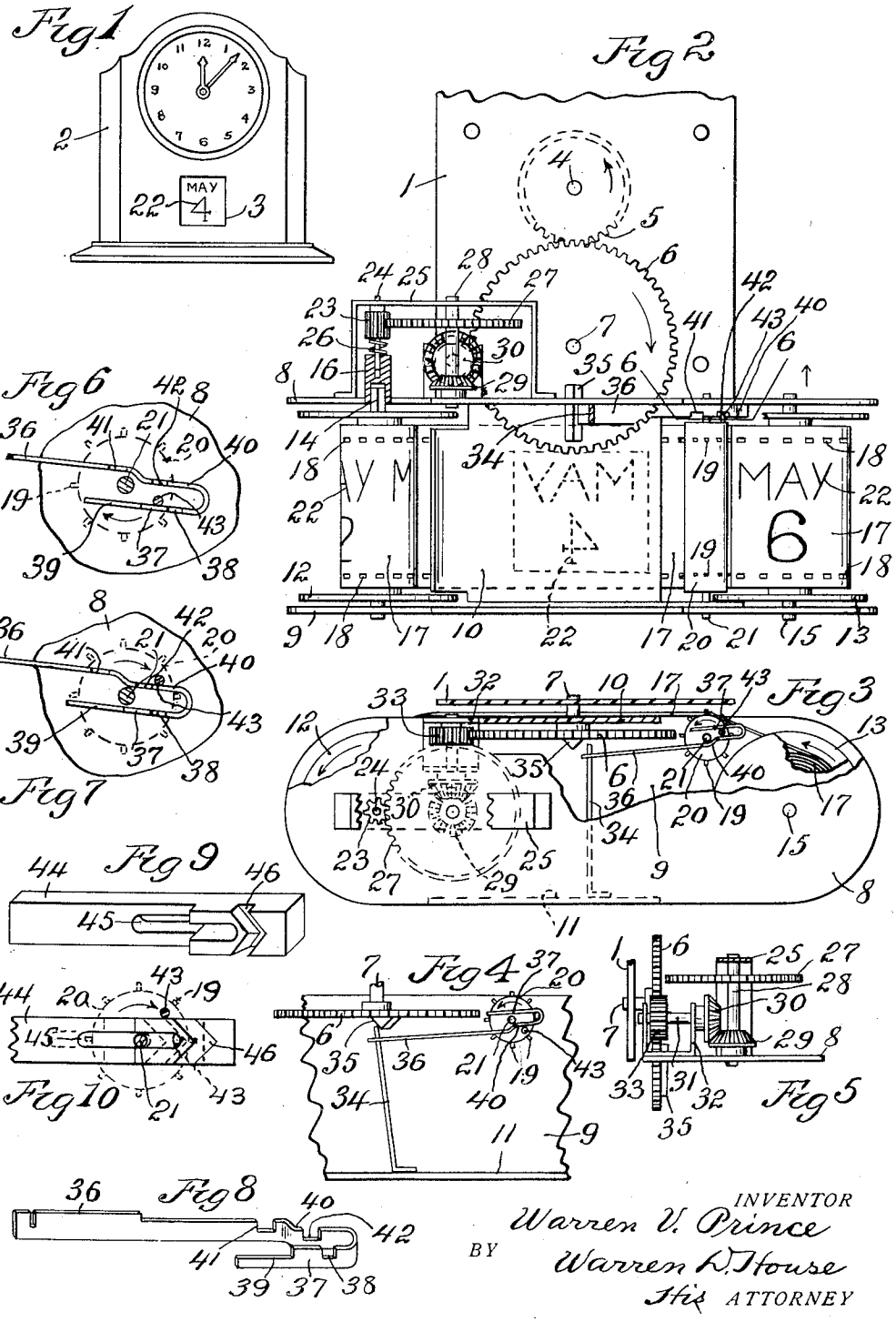
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CLOCK ACTUATED DISPLAY MECHANISM

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CLOCK ACTUATED DISPLAY MECHANISM

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My invention relates to improvements in clock actuated display mechanisms, designed for periodically displaying indicia at spaced intervals, which indicia may represent any desired matter, such as dates, advertising or the like. My invention is particularly well adapted for employment in connection with calender clocks for daily displaying dates in chronological order.

One of the objects of my invention is to provide in a mechanism of the kind described novel means for moving an indicia bearing member by clock actuated means which includes a slip friction driving means which exerts a constant yielding effort for moving forwardly the indicia bearing member.

A further object of my invention is to provide novel escapement means by which the indicia bearing member is held from advancing excepting periodically, as controlled by time controlled means.

Still another object of my invention is to provide a mechanism of the kind described which is simple, cheap, durable, not likely to get out of order, which can readily be applied to existing clockwork mechanism, and which is effective and reliable in its operation.

The novel features of my invention are hereinafter fully described and claimed.

In the accompanying drawing, which illustrates my invention,

Fig. 1 is a reduced front view of a calender clock provided with my improvement.

Fig. 2 is an enlarged rear view, partly in elevation and partly in section and broken away, of my improved mechanism shown applied to a clock mechanism, a portion only of which is shown.

Fig. 3 is a top view, partly broken away and partly in horizontal section of what is shown in Fig. 2.

Fig. 4 is a plan view of the escapement mechanism, showing the spring engaged with the revoluble abutment, and the toothed strip engaging member as having revolved part of a revolution from the position in which it is shown in Fig. 3.

Fig. 5 is an elevation of a portion of the time actuated driving mechanism.

Fig. 6 is an enlarged view looking upwardly on the line 6—6 of Fig. 2, showing one position of a portion of the escapement mechanism.

Fig. 7 is a view similar to Fig. 6, showing another position of the escapement mechanism.

Fig. 8 is an enlarged perspective view of the reciprocative escapement member, such as is shown in Figs. 2, 3, 4, 6 and 7.

Fig. 9 is a perspective view of a modification of the reciprocative escapement member.

Fig. 10 is an under view of a portion of the escapement member shown in Fig. 9, looking at the under side thereof, the toothed strip engaging member being shown in dotted lines.

Similar characters of reference designate similar parts in the different views.

1 designates a clock frame of usual construction, 2 the casing containing the frame and having an opening in its front designated by 3 and constituting a place of observation at which indicia consecutively appear at spaced intervals of time. 4 designates the hour hand shaft of the clock, which shaft makes two revolutions in twenty four hours and is a part of the clock movement.

My invention provides a gear wheel 5 secured to the hour hand shaft 4 and meshing with a gear wheel 6 having twice the diameter of the gear wheel 5, and revoluble once in twenty four hours on a shaft 7 mounted in the frame 1.

8 and 9 designate respectively the top and bottom plates of a supplemental frame connected by front and back plates 10 and 11. The bottom plate 9 is removable for the insertion and removal of two reels 12 and 13, the lower ends of the shafts 14 and 15 are revoluble in the bottom plate 9. The upper end of the shaft 15 is revoluble in the upper plate 8, and the upper end of the shaft 14 is squared and removably fitted in a square hole in the lower end of a vertical clutch member 16 which is revoluble in the top plate 8.

The reel 13 has wound upon it a flexible indicia strip 17 having adjacent to its longitudinal edges respectively two longitudinal rows of perforations 18 into which are adapted to enter the teeth 19 disposed in two annular rows adjacent to the upper and lower ends respectively of a vertical cylindrical measuring member 20 having an axial shaft 21 revoluble in the plates 8 and 9.

One end of the strip 17 is attached to and adapted to be wound on the reel 12. Suitable indicia adapted to be consecutively displayed at the place of observation 3 and disposed in a longitudinal series on the front side of the strip 17 are provided. In Fig. 2 such indicia, designated by 22, comprises dates, which are arranged on the strip in chronological order so as to be consecutively displayed at the observation place 3 daily as the clock work revolves the reel 12 in the manner to be hereinafter described.

The strip 17 passes in front of the frame plate 10.

A second clutch member 23, which, as shown, is a pinion has the lower end of its axial shaft 24 revoluble in the upper end of the clutch member 16, Fig. 2, the upper end of the shaft 24 being revoluble in a bracket 25 mounted on the top plate 8.

For effecting a slip friction drive from the clutch member 23 to the clutch member 16, a coil spring 26 encircles the shaft 24 and bears at its upper and lower ends respectively against the pinion clutch member 23 and the clutch member 16.

A spur gear wheel 27 meshes with the pinion 23 and is fastened to a vertical shaft 28 mounted in the bracket 25 and the plate 8. A bevel gear wheel 29 fastened to the shaft 28 meshes with a bevel gear wheel 30 fastened to a horizontal shaft 31 mounted in a U shaped bracket 32, fastened on top of the plate 8, Figs. 2, 3 and 5. Fastened to the shaft 31 is a pinion 33 which meshes with the gear wheel 6, Figs. 3 and 5.

When the gear wheel 6 is revolved once in twenty four hours by the gear wheel 5 in the daily operation of the clock, the pinion 23 will be revolved constantly through the pinion 33, shaft 31, bevel gears 29 and 30, shaft 28 and spur gear wheel 27.

The constant revolution of the pinion clutch member 23 will through the friction coil spring 26 exert a constant effort, which, however, is yielding, for revolving the clutch member 16 and with it the reel 12. When the strip 17 is not held from being wound upon the reel 12, the latter in revolving will wind the strip thereon.

To hold the strip 17 from being wound on the reel 12 excepting once each twenty four hours, an escapement is provided for holding the toothed measuring member 20 from revolving, thereby holding the strip 17 from being wound upon the reel 12, until the measuring toothed member 20 is released. Such escapement means preferably comprises, as shown in Figs. 3 and 4, the following described parts, the toothed member 20, a horizontal flat spring and a reciprocative member 36.

The horizontal spring 34 is fastened at its rear end to the back frame plate 11. Its free front end is adapted to be engaged by an abutment 35, disposed eccentrically on the rear side of the gear wheel 6, and moved to the left, from the position, shown in Fig. 3, which is its initial normal position, to the position shown in Fig. 4. When the abutment 35 releases the spring 34 on the further revolution of the gear 6, the spring will be retracted automatically to its initial position, thus completing an oscillation of the spring.

Attached at one end portion to the spring 34 adjacent to the free end of the latter is a reciprocative member, which, as shown in Figs. 2, 3, 4, 6, 7 and 8, comprises a bar having at its end which is distant from the spring 34 a U shaped portion having one arm 37 provided in its under side with two notches 38 and 39, Figs. 6, 7 and 8, and the other arm 40 having in its under side two notches 41 and 42.

The arms 37 and 40 of the member 36 are disposed at opposite sides respectively of the shaft 21. The upper end of the measuring member 20 is provided with an upwardly extending projection, comprising a pin 43, which normally is disposed between the arms 37 and 40 and engages the inner side of the arm 37, and, as the pin 43 is eccentric to the shaft 21, the measuring member will be held from revolving, and in turn will hold the strip 17 from being wound onto the reel 12.

When the abutment 35 engages the spring 34 and moves it to the left, as viewed in Fig. 4, the reciprocative member 36 will also be moved in that direction, thus permitting the pin 43 to pass through the notches 38, 39 and 41 and to strike against the outer side of the arm 40, as shown in Figs. 4 and 7, thereby holding the member 20 and strip 17 from further movement until the abutment 35 has released the spring 34. Upon this being effected, the spring 34 springs back to its initial normal position, shown in Figs. 2 and 3, thus restoring the reciprocative member 36 to its normal position, shown in Figs. 2, 3 and 6 during which movement, the pin 43 passes through the notch 42 and contacts with the inner side of the arm 37, after having completed a revolution during which the measuring member 20 will have permitted the strip 17 to move to a position in which the next indicium 22 will be presented at the place of observation 3. The strip and measuring member 20 will then remain stationary until the abutment 35 has made another daily revolution and engages the spring 34, when the escapement operation described will be repeated.

During the time that the strip 17, measuring member 20 and reel 12 are held stationary by the engagement of the pin 43 with the reciprocative member 36, the time controlled driving means which has been described will continue the constant revolution of the pinion clutch member 23, but the spring 26 will not effect any driving movement from the pinion 23 to the other clutch member 16, but will have a slipping action between the two clutch members.

The spring 26 will again effect a driving action on the clutch member 16, when the reciprocative member 36 again releases the measuring member 20, and the reel 12 will again be revolved to wind thereon the strip 17 an amount sufficient to present the next indicium 22 at the place of observation 3.

In Figs. 9 and 10 is shown a modified form of reciprocative member 44 comprising a bar having a longitudinal slot 45 for receiving the shaft 21, and having on its under side a V shaped groove 46. The bar 44 is attached at its end distant from the groove 46 to the spring 34 and is reciprocated in the same manner by said spring as is the member 36.

Normally the pin 43 engages one side of the bar 44, as shown in Fig. 10. When the spring 34 moves the bar 44 to the left, as viewed in Fig. 10, the pin 43 will enter the groove 46 and will be held therein at the apex of the groove until the abutment 35 releases the spring 34, upon which the latter will retract the bar 44 to its initial positon, shown in solid lines in Fig. 10, and the pin 43 will pass out of the groove 46 and under and across the bar 44, and will come to rest at its initial position, shown in solid lines in Fig. 10, against the bar 44, upon which the member 20 and the strip 17 will stop moving.

From the foregoing it will be understood that the gear wheels 5 and 6, actuated by the hour hand shaft 4 of the clock, constitute clock actuated driving means which effect constant revolution of the slip friction clutch member comprising the pinion 23, through the intermediacy of the pinion 33, shaft 31, bevel gear wheels 30 and 29, shaft 28 and gear wheel 27. It will also be understood that, when the indicia strip 17 is free to move, it will be wound on the reel 12 which will be revolved by the clutch member 16, which the pinion 23 revolves through the coil spring 26.

It will be further understood that the gear wheel **6** constitutes clock actuated means which, through the abutment **35**, controls the operation of the escapement by swinging and then releasing the spring **34**, which, by reciprocating the bar **36**, permits the toothed member **20** to revolve a revolution, thus enabling the reel **12** to revolve and advance the indicia strip **17**.

Many modifications, within the scope of the appended claims, may be made without departing from the spirit of my invention.

What I claim is:—

1. In a clock actuated display mechanism, a member having thereon a series of indicia and movable in one direction to positions in which said indicia will appear consecutively at a place of observation, clock actuated driving means, means driven by said clock actuated means and including a slip friction clutch which exerts an effort on said member for moving the latter in said direction, and means controlled by said clock actuated driving means by which said member is permitted to move in said direction only intermittently at spaced distances and intervals.

2. In a clock actuated display mechanism, a strip having thereon a longitudinal series of indicia and longitudinally movable in one direction to positions in which said indicia will appear consecutively at a place of observation, clock actuated driving means, means driven by said clock actuated means and including a slip friction clutch which exerts an effort on said strip for moving the latter in said direction, and means controlled by said clock actuated driving means by which said strip is permitted to move in said direction only intermittently at spaced distances and intervals.

3. In a clock actuated display mechanism, a strip having thereon a longitudinal series of indicia longitudinally movable in one direction to positions in which said indicia will appear consecutively at a place of observation, a reel to which said strip is attached and adapted to be wound thereon, clock actuated driving means, means driven by said clock actuated means and including a slip friction clutch which engages and exerts an effort to revolve said reel in a direction for moving said strip in said direction, and means controlled by said clock actuated driving means by which said strip is permitted to move in said direction only intermittently at spaced distances and intervals such that said indicia will appear consecutively at said place of observation.

4. In a clock actuated display mechanism, a strip having thereon a longitudinal series of indicia, a revoluble reel to which said strip is attached and adapted to be wound thereon, clock actuated driving means including a revoluble member, means actuated by said revoluble member and including a slip friction clutch which engages and exerts an effort to revolve said reel, but which has a non-driving action when said reel is held from revolving, and means controlled by said revoluble member by which said strip is permitted to be drawn by said reel only intermittently and at measured intervals and distances such that said indicia will appear consecutively at a place of observation.

5. In a clock actuated display mechanism, a strip having thereon a longitudinal series of indicia, a revoluble reel to which said strip is attached and adapted to be wound thereon, a slip friction clutch comprising two revoluble members one having means for engaging and revolving said reel, clock actuated driving means revolving the other clutch member, and means controlled by said clock actuated driving means by which said strip is permitted to be drawn by said reel only intermittently and at measured intervals and distances such that said indicia will appear consecutively at a place of observation.

6. In a clock actuated display mechanism, a strip having thereon a series of indicia, a revoluble reel to which said strip is attached and adapted to be wound thereon and drawn thereby to positions in which said indicia will appear consecutively at a place of observation, two revoluble clutch members, slip friction means connecting said members which exerts an effort for revolving one from the other, one of said members having means for engaging and revolving said reel, clock actuated driving means constantly revolving the other clutch member, said slip friction means having a non-driving action when said strip is held and holds said reel from turning and an escapement normally holding said strip from longitudinal movement but periodically releasable therefrom by said clock actuated driving means.

7. In a clock actuated display mechanism, a strip having thereon a longitudinal series of indicia, a revoluble reel to which said strip is attached and adapted to be wound thereon and drawn to positions in which said indica will appear consecutively at a place of observation, two revoluble clutch members, one being a pinion and the other having means for engaging and revolving said reel, slip friction means connecting said members and exerting an effort for revolving one from the other and having a slipping non-driving action when said reel is held from revolving, clock actuated driving means including a gear wheel meshing with said pinion, and an escapement controlled by said gear wheel permitting only intermittent longitudinal movement of said strip.

8. In a clock actuated display mechanism, a strip having thereon a longitudinal series of indicia, a revoluble reel to which said strip is attached and adapted to be wound thereon and drawn thereby to positions in which said indicia will appear consecutively at a place of observation, two revoluble clutch members, one having means for engaging and revolving said reel, a spring between and bearing against and affording slip friction driving engagement between said members, clock actuated driving means revolving the other clutch member and an escapement controlled by said clock actuated driving means permitting only intermittent longitudinal movement of said strip.

9. In a clock actuated display mechanism, a strip having thereon a longitudinal series of indicia, a revoluble reel to which said strip is attached and adapted to be wound thereon and drawn to positions in which said indicia will appear consecutively at a place of observation, two revoluble clutch members, one being a pinion and the other having means for engaging and revolving said reel, slip friction means connecting said members and exerting an effort for revolving one from the other and having a slipping non-driving action when said reel is held from revolving, clock actuated driving means including a revoluble gear wheel meshing with said pinion, and means controlled by said gear wheel by which said strip is permitted to be drawn by said reel only intermittently and at measured intervals and distances.

10. In a clock actuated display mechanism, a strip having thereon a longitudinal series of indicia, time controlled means exerting a yielding

effort for moving said strip longitudinally in one direction, an oscillative spring, means actuated by said time controlled means for periodically moving said spring from an initial position to which, when released, said spring returns, a member engaging and revoluble by said strip and having measuring holding means which on successive releasings of said member permits said strip to be intermittently moved in said direction to positions in which said indicia will appear consecutively at a place of observation, and means actuated by said spring by which said revoluble member is permitted to revolve a predetermined amount for each oscillation of said spring.

11. In a clock actuated display mechanism, a strip having thereon a longitudinal series of indicia, time controlled means exerting a yielding effort for moving said strip longitudinally in one direction, an oscillative spring, means actuated by said time controlled means for periodically moving said spring from an initial position to which, when released, said spring returns, a member engaging and revoluble by said strip and having measuring holding means which on successive releasings of said member permits said strip to be intermittently moved in said direction to positions in which said indicia will appear consecutively at a place of observation, and a member engaging and reciprocative by said spring and having means engaging said revoluble member by which the latter is permitted to revolve a predetermined amount for each reciprocation of said reciprocative member.

12. In a clock actuated display mechanism, a strip having thereon a longitudinal series of indicia, time controlled means, including a revoluble member having an eccentric abutment, exerting a yielding effort for moving said strip longitudinally in one direction, an oscillative spring which in the revolution of said revoluble member is engaged and moved from an initial position by said abutment and which when released from said abutment returns to said initial position, and means actuated by said spring upon successive oscillations of the latter by which said strip is permitted to move in said direction only intermittently at spaced distances and intervals such that said indicia will appear consecutively at a place of observation.

13. In a clock actuated display mechanism, a strip having thereon a longitudinal series of indicia, clock actuated driving means exerting a yielding effort for moving said strip longitudinally in one direction, a revoluble member having toothed engagement with said strip and revoluble thereby and upon successive revolutions of said member permitting said strip to move in said direction spaced distances such that said indicia will appear consecutively at a place of observation, said member having at one end an eccentrically disposed projection, a longitudinally reciprocative member normally engaging said projection and holding said revoluble member from revolving and which when reciprocated permits said revoluble member to make a revolution, and means controlled by said clock actuated driving means for reciprocating said reciprocative member.

14. In a clock actuated display mechanism, a strip having thereon a longitudinal series of indicia, time controlled means, including a revoluble member having an eccentric abutment, exerting a yielding effort for moving said strip longitudinally in one direction, and oscillative spring which in the revolution of said revoluble member is engaged and moved from an initial position by said abutment and which when released from said abutment returns to said initial position, a revoluble member having toothed engagement with said strip and revoluble thereby and upon successive revolutions permitting said strip to move in said direction spaced distances such that said indicia will appear consecutively at a place of observation, said toothed member having at one end an eccentrically disposed projection, and a member engaging and longitudinally reciprocative by said spring and normally engaging said projection and holding said toothed member from revolving and which when reciprocated permits said toothed member to make a revolution.

15. In a clock actuated display mechanism, a strip, having thereon a longitudinal series of indicia, means for yieldingly moving said strip longitudinally in one direction, a toothed member having toothed engagement with and revoluble by said strip and having at one end an eccentrically disposed projection, an oscillative spring, a revoluble member having an eccentric abutment which on the revolution of said revoluble member moves said spring from an initial position to which said spring upon release from said abutment returns, and a member reciprocative by said spring when the latter is oscillated and normally engaging said projection and holding said toothed member from revolving and which when reciprocated releases said projection and permits said toothed member to make a revolution and then reengages said projection and holds said toothed member from revolving until said reciprocative member makes another reciprocation.

16. In a clock controlled display mechanism, the combination with a longitudinally movable strip having thereon a longitudinal series of indicia, and escapement means normally holding said strip stationary, of a clock movement, means actuated by said clock movement for normally longitudinally moving said strip, and means actuated by said clock movement periodically operating said escapement means to permit said strip to be longitudinally moved spaced distances at intervals measured by said clock movement.

17. In a clock controlled display mechanism, the combination with a longitudinally movable strip having thereon a longitudinal series of indicia, and escapement means normally holding said strip stationary, of a clock movement, a member revoluble by said clock movement, means actuated by said member for longitudinally moving said strip, and means actuated by said member periodically operating said escapement means to permit said strip to be longitudinally moved spaced distances at intervals measured by said clock movement.

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