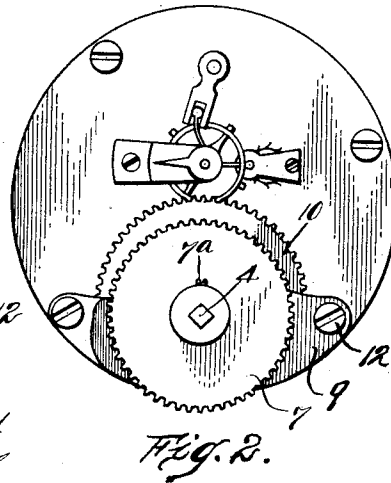
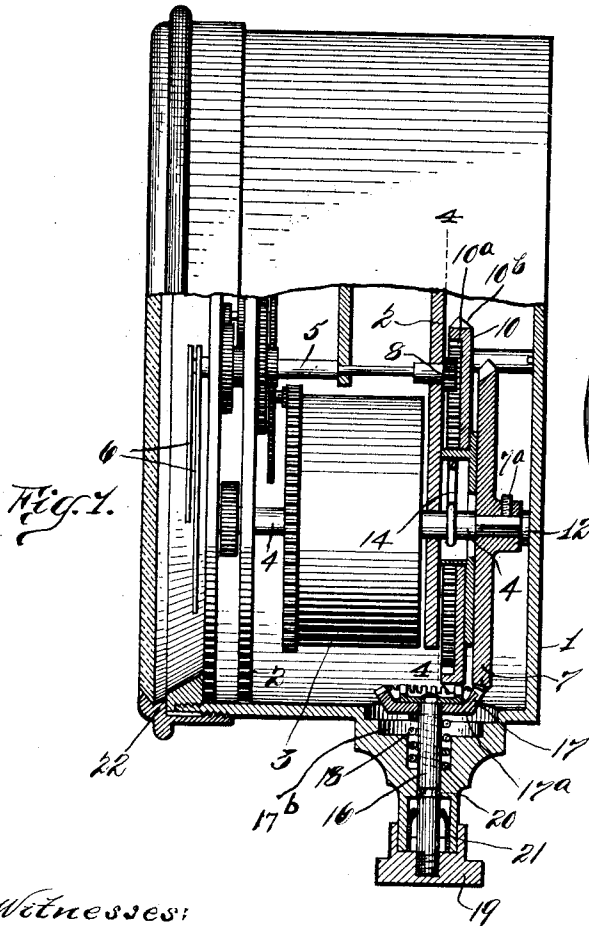
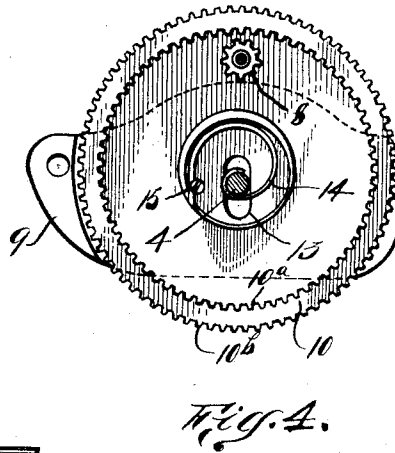
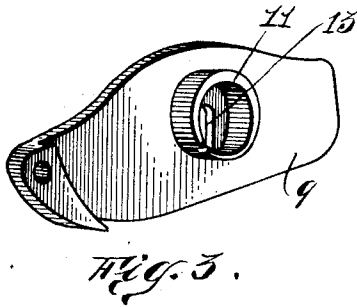


C. H. BELL.
STEM WINDING AND SETTING MECHANISM FOR CLOCKS.
APPLICATION FILED AUG. 26, 1909.

1,036,954.

Patented Aug. 27, 1912.



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UNITED STATES PATENT OFFICE.

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STEM WINDING AND SETTING MECHANISM FOR CLOCKS.

1,036,954.

Specification of Letters Patent.

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Application filed August 26, 1909. Serial No. 514,709.

To all whom it may concern:

Be it known that I, CHARLES H. BELL, a citizen of the United States, residing at Thomaston, Connecticut, have invented certain new and useful Improvements in Stem Winding and Setting Mechanism for Clocks, of which the following is a clear, full, and exact description.

My invention relates to stem-winding and setting mechanism and consists in a more simplified construction than the devices now in use to perform these functions.

Although I have preferably shown my construction as adapted to a clock movement, it is obvious that it might be equally well applied to a watch movement of more delicate construction. I prefer to use a longitudinally movable stem common in the setting devices of watch movements for both winding and setting, and since a clock movement is generally supplied with a comparatively strong main spring, my invention consists, among other advantages, in utilizing the force of another spring which is required to keep the teeth on the stem in engagement with the teeth of the winding train intermeshed therewith, in order that the mechanism for operating the hand-setting arbor may be simplified by making use of the power of said other strong spring.

My invention will be more particularly defined in the claims.

In the drawings which show the preferred embodiment of my invention, Figure 1 is a side elevation of the clock with the casing partly broken away to show the movement, and parts of the movement are shown in section to more clearly illustrate their connections; Fig. 2 is a rear view of the movement frame shown in Fig. 1, which frame has so much of the movement thereon as to clearly illustrate my invention; Fig. 3 is a detached perspective view of the pivoted supporting frame; and Fig. 4 is another view of said supporting frame showing the connecting gear wheel mounted thereon.

The clock casing is indicated at 1, and separate from this casing and removably carried therein is the movement frame 2, said frame consisting of the various face plates and connecting studs to suitably support the different parts of the movement thereon. Any usual form of bezel 22 is employed to

retain the movement frame in its position in the casing.

I have not illustrated the entire mechanism of a clock movement but only so much thereof as will clearly show the connection of my improvement therewith. The essential features of the movement required for this purpose consist of the main spring indicated at 3, suitably carried and fixed at one end to the main winding arbor 4, said arbor being mounted in suitable bearings in the movement frame and extending there-through from front to rear. Gear connections are conventionally shown from this main winding arbor 4 to the hands of the clock, and it is not considered necessary to more fully illustrate this gear train for the complete understanding of the present invention. Mounted in bearings in the movement frame and extending parallel to the main arbor is the hand-setting arbor 5, which also extends through from front to rear of the frame. This arbor is preferably located at a distance from the main arbor 4 equal at least to the radius of the unwound main spring 3, in order to give said spring room to expand. A gear wheel 7 is fixed to the rear end of the main arbor 4 by means of a stud screw 7^a. In order to mount a second gear wheel I have pivoted on the movement frame at the stud 12 and adjacent to said gear wheel 7 a supporting frame 9, which preferably is adapted to swing across the main arbor, and is supplied with a slot 13 therein through which said arbor extends. This supporting frame is constructed with an outwardly projecting circular flange 11 which encircles the main arbor, and is preferably arranged around the slot 13. With its bearing on the outer periphery of this flange is mounted a second connecting gear wheel 10, said gear wheel being provided with a set of interior gear teeth 10^a, as well as an exterior set of teeth 10^b. A pinion 8 fixed to the outer end of the hand-setting arbor 5 is adapted to mesh with the internal gear teeth of gear wheel 10 when the same is moved into engaging position. Any preferred form of spring means may be supplied to swing the pivoted frame downwardly to bring about this engagement, and I have preferably shown a coiled spring 14 fixed to the pivoted frame within the flange

at 15 and bearing upon the main arbor 4 to produce a tendency for this pivoted frame to swing downwardly and to bring the internal gear teeth of wheel 10 in engagement with pinion 8.

Mounted in the clock casing is a longitudinally movable and rotative stem 16 having a thumb-operating portion 19 at its outer end, and having fixed to its inner end a preferred form of gear means consisting, in the present embodiment, of two concentric crown gears 17 and 17^a, one within the other. A coiled spring 18 surrounds the stem 16 and tends to force the same inwardly to bring its crown gears in engagement with the aforementioned gear wheels, the gear wheel 7 being provided with properly beveled teeth to engage with the outer crown gear 17, and the teeth 10^b of the gear wheel 10 properly beveled to engage the inner beveled gear 17^a. It is understood, however, that this double crown gear means is only a preferred form and that a single crown gear, or other gear means, might be equally well used to operate said gear wheels. The stem 16 is supplied with a circular groove 20, and spring plates 21 mounted on the casing are adapted to engage said groove when the stem is withdrawn and hold the same in its outer position, a common construction in winding stems.

The spring 18 surrounding the stem 16 is made sufficiently strong to keep the crown gear of the stem in engagement with the gear wheel 7 for winding the clock against the force of the main spring, and this spring 18 therefore is considerably stronger than the spring 14 of the pivoted supporting frame. The wheel 10 therefore being in engagement with the crown gear 17^a of the stem, is forced back by the same so that its internal gear teeth are not normally in engagement with the pinion 8 of the hand-setting arbor. However, when the stem 16 is withdrawn against the force of its spring, the connection between the crown gear 17 and gear wheel 7 is broken, but the gear wheel 10 mounted on the swinging support is carried by the spring 14 outwardly so that its exterior teeth 10^b continue in engagement with the crown gear 17^a, and also its internal gear teeth 10^a come into mesh with the pinion 8 of the hand-setting arbor. The stem is held in its outer position by the spring plates 21, and if now turned will operate the hand-setting arbor to turn the hands. It is clear that when the stem is again pushed inwardly it will be connected with the main arbor for winding the clock and disconnected from the hand-setting arbor.

It will be apparent from the drawings that when the present invention is embodied in the form of a clock it is desirable that the main spring arbor 4 and the hand-set-

ting arbor 5 be both mounted in bearings in the movement plates 2, 2 so that both said arbors extend to the rear plate, and also that in this modification of the invention the movement frame is bodily removable in one direction from the casing without moving the stem 16 from the casing. The movement extends past the line of movement of the stem and the stem is provided with means for withdrawing the gear means thereof from the winding and setting trains so that the removal of the movement from the case is permitted. Preferably to this end the stem 16 has its gear means 17, 17^a arranged thereon so as to be moved back into a recess 17^b in the inner wall of the casing to permit the ready removal of the movement from the case.

I claim:

1. In a stem-winding and setting mechanism in combination, a longitudinally movable and rotative stem, operating means fixed thereto and movable with said stem and normally in connection with said winding mechanism, means for pressing said stem into a shifted position, a bodily movable gear wheel independent of the winding mechanism and held constantly in mesh with said operating means for connecting the same to said setting mechanism and normally held in inoperative position, and means acting in opposite direction to said stem pressing means for putting said gear wheel in operative position to form said connection when said stem is moved to carry its operating means out of connection with said winding mechanism.

2. In combination, a time piece having a movement comprising a winding and a setting train, an endwise movable stem, gear means fixed thereto and movable with said stem and normally connected with said winding train but adapted to be disconnected therefrom when said stem is moved endwise, and a bodily-movable gear wheel independent of the winding mechanism and at all times in mesh with the gear on said stem and normally held out of engagement with the setting train, and means released by said stem to automatically move said gear wheel into engagement with said setting train in the same direction as said stem is moved when said stem is moved to disconnect the winding train.

3. In a stem-winding and setting mechanism in combination, a longitudinally movable and rotative stem, operating means on said stem, spring means for normally keeping said operating means connected to said winding mechanism, a bodily-movable gear wheel for connecting said operating means to said setting mechanism normally held inactive by said spring means, oppositely acting and weaker spring means for moving said gear wheel bodily in the plane of its

rotation to connect said stem and setting mechanism and only made effective by the suppression of said first named spring means.

4. In a stem-winding and setting mechanism in combination, a movement frame, main winding and hand-setting arbors mounted in bearings on said frame and extending parallel to each other through to the rear face plate thereof and spaced apart a distance at least equal to the radius of the unwound main spring, a longitudinally movable and rotative stem having gear means thereon normally in connection with said winding arbor, an independently mounted gear wheel, also independent of the winding mechanism and bodily movable to connect said stem and setting arbor and normally held in inoperative position, and means for moving said gear wheel to connect the stem to the hand-setting arbor when said stem is moved to disconnect its gear means from the winding arbor.

5. In a stem-winding and setting mechanism in combination, a clock casing, a movement frame carried in said casing, main winding and hand-setting arbors mounted on said frame and extending parallel through the rear face plate thereof and spaced apart a distance at least equal to the radius of the unwound main spring, a longitudinally-movable and rotative stem mounted in said casing and having operating means thereon normally in connection with said winding arbor when said frame is in position in said casing, and means independent of the winding mechanism for connecting said stem-operating means with said hand-setting arbor when said stem is moved to break its connection with said main-winding arbor, said movement frame being bodily removable in one direction from said casing without moving said stem or its operating means from the casing.

6. In a time piece, the combination of a movement case provided with an endwise movable stem mounted therein, and having annular toothed gear means, and a movement mounted removably sidewise in one direction in said case and comprising a winding and a setting train, and a gear wheel independent of the winding mechanism and normally held out of engagement with the setting train but automatically slidable in its own plane into engagement therewith when said stem is moved endwise, said toothed gear means carried by said movable stem being normally connected with the winding train but adapted to be disconnected therefrom when said stem is moved endwise, as stated, and said stem and its toothed gear means remaining in position on said case when said movement is removed from the case.

7. A time piece comprising in combina-

tion a case, a movement contained therein and having a winding and a setting train and an endwise movable stem mounted in said case having annular toothed gear means normally protruding from the inner wall of said casing for operating said winding and said setting train, said movement extending past the line of movement of said stem and said stem provided with means for withdrawing said gear means for said winding and setting trains to permit the removal of said movement from said case.

8. A time piece comprising in combination a case, a movement contained therein closely fitting the recessed inner wall of said casing and having a winding and a setting train, an endwise movable stem mounted in said case having gear means normally protruding from the recessed inner wall of said casing for operating said winding and said setting train, and a spring for holding said stem and gear means in its inward position to engage one of said trains, said stem provided with means for withdrawing said gear means for said winding and setting trains into the recess to permit the removal of said movement from said case.

9. In a stem-winding and setting mechanism in combination, a movement frame, main-winding and hand-setting arbors mounted in bearings on said frame and extending parallel to each other through to the rear face plate thereof and spaced apart a distance at least equal to the radius of the unwound main spring, a longitudinally movable and rotative stem, operating means on said stem, spring means for normally keeping said operating means connected to said winding arbor and out of connection with said setting arbor, oppositely acting and weaker spring means tending to connect said setting arbor with said operating means of said stem and only made effective by the suppression of said first named spring means.

10. In a stem-winding and setting mechanism in combination, a longitudinally movable and rotative stem, main-winding and hand-setting arbors, gear means fixed on said stem for operating said arbors, a pair of connecting gear wheels one fixedly mounted on one of said arbors and normally in mesh with said stem gear means, the other mounted so as to be bodily movable and held constantly in mesh with said stem gear means, and means for connecting said second gear wheel to the other arbor when said stem is moved to withdraw its gear means from said first gear wheel.

11. In a stem-winding and setting mechanism in combination, a longitudinally movable and rotative stem, main-winding and hand-setting arbors, gear means fixed on said stem for operating said arbors, a pair of connecting gear wheels one fixedly

mounted on said main winding arbor and normally in mesh with said stem gear means, a pivoted support for said second gear wheel normally holding the same out
 5 of connection with said hand-setting arbor, spring means for holding said second gear wheel constantly in mesh with said stem gear means and adapted to connect it with said hand-setting arbor when said stem is
 10 moved to withdraw its gear means from said first gear wheel.

12. In a stem-winding and setting mechanism in combination, a longitudinally movable and rotative stem, main-winding and
 15 hand-setting arbors, gear means fixed on said stem for operating said arbors, a connecting gear wheel fixedly mounted on said main winding arbor and normally in mesh with said stem gear means, a pivoted support mounted to swing across said main arbor and having a flange portion encircling
 20 said arbor, a second gear wheel having its bearing on said flange, a spring mounted on said support and bearing against said main arbor for keeping said second gear wheel constantly in mesh with said stem gear means, said spring adapted to swing said support and connect said second gear wheel
 25 to the hand-setting arbor when said stem is moved to withdraw its gear means from said first gear wheel.

13. In a stem-winding and setting mechanism in combination, a longitudinally movable and rotative stem, main-winding and
 35 hand-setting arbors, gear means fixed on said stem for operating said arbors, a connecting gear wheel fixed to said main arbor, and a spring on said stem for normally keeping its gear means in mesh with said
 40 connecting gear wheel, a pivoted supporting frame mounted to swing across said main

arbor and having a flange encircling the same, a second connecting gear wheel having its bearing on the outside of said flange, a spring fixed to said frame within said
 45 flange and bearing against said main arbor for keeping said second gear wheel in mesh with said stem gear means, said spring adapted to swing said supporting frame and connect said second gear wheel to the hand-
 50 setting arbor when said stem is moved against its spring to withdraw its gear means from said first gear wheel.

14. In a stem-winding and setting mechanism in combination, a movement frame, 55 main-winding and hand-setting arbors mounted thereon, a gear wheel fixed to said main arbor and a pinion fixed to said hand-setting arbor, a longitudinally movable and rotative stem having gear means thereon, 60 and spring means for normally holding said gear means in mesh with said fixed gear, a pivoted support adapted to swing across said main arbor and having a flange portion encircling the same, a second gear wheel hav- 65 ing its bearing on said flange and provided with internal teeth adapted to mesh with the pinion of the hand-setting arbor, said gear being constantly in engagement with said stem gear means and held thereby normally 70 with its internal gear teeth out of mesh with said pinion, spring means mounted within said flange for moving said second gear wheel to engage its internal teeth with said pinion when said stem is moved against its 75 spring.

Signed at Thomaston this 23 day of August 1909.

CHARLES H. BELL.

Witnesses:

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