G. KERN.

STEM WINDING AND SETTING MECHANISM FOR WATCHES.

APPLICATION FILED FEB. 15, 1910.

955,336.

Patented Apr. 19, 1910.

2 SHEETS—SHEET 1.

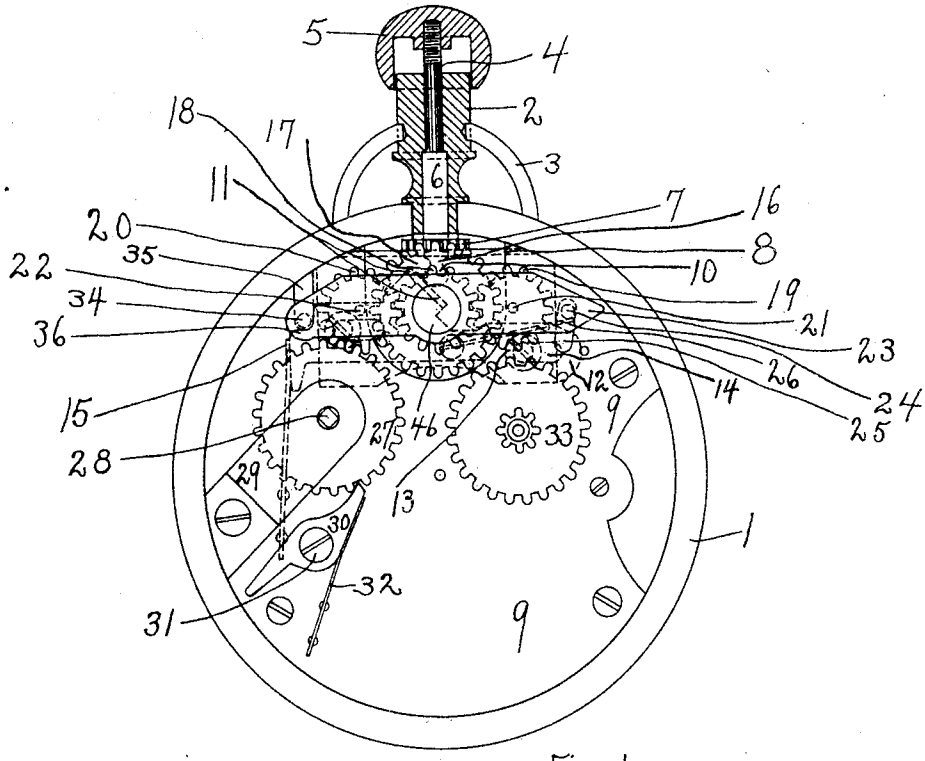

Fig. 1

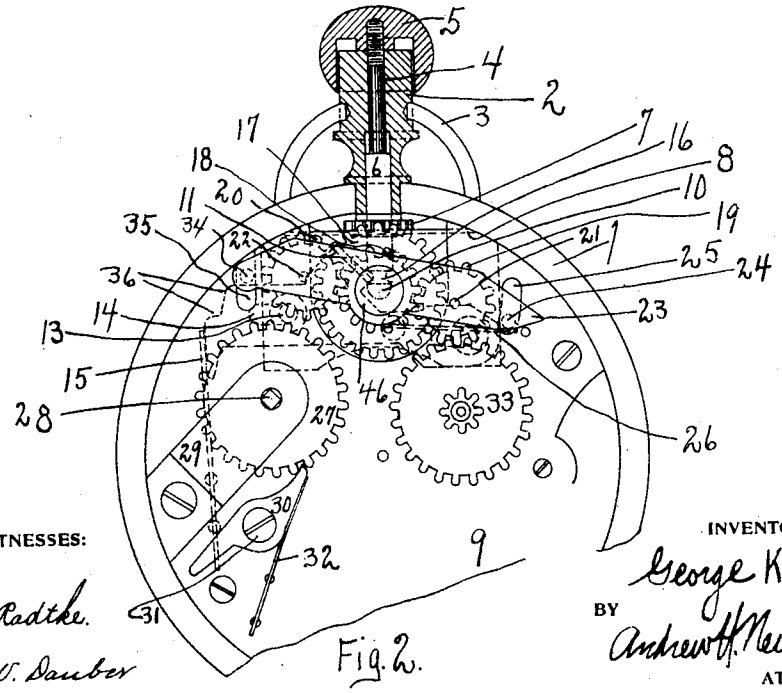

Fig. 2.

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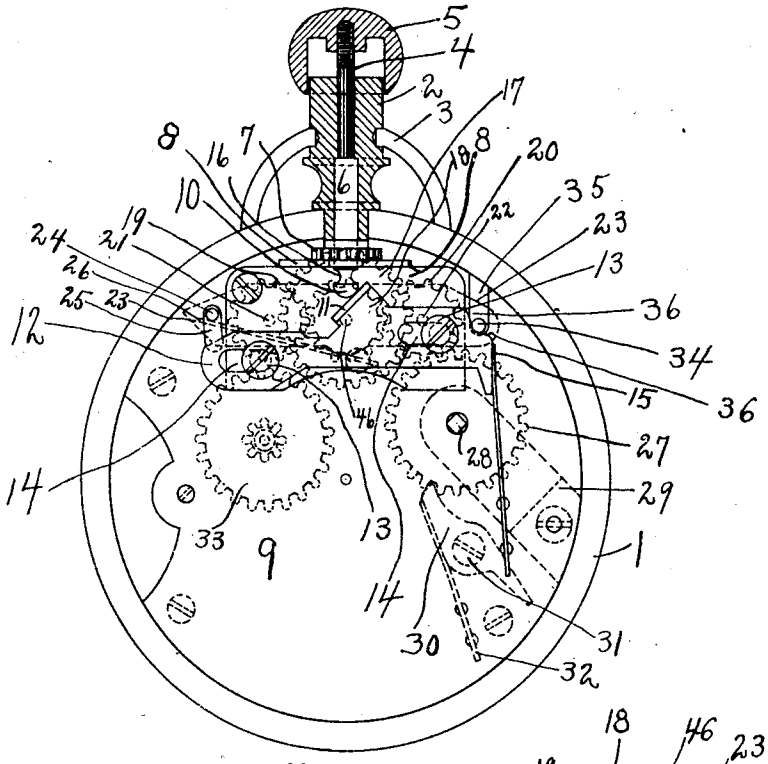

Fig. 3.

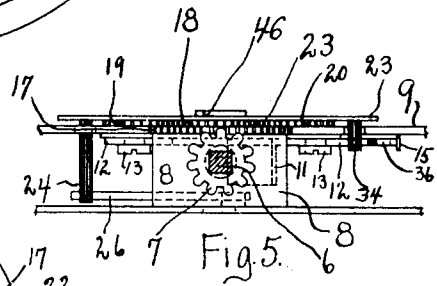

Fig. 5.

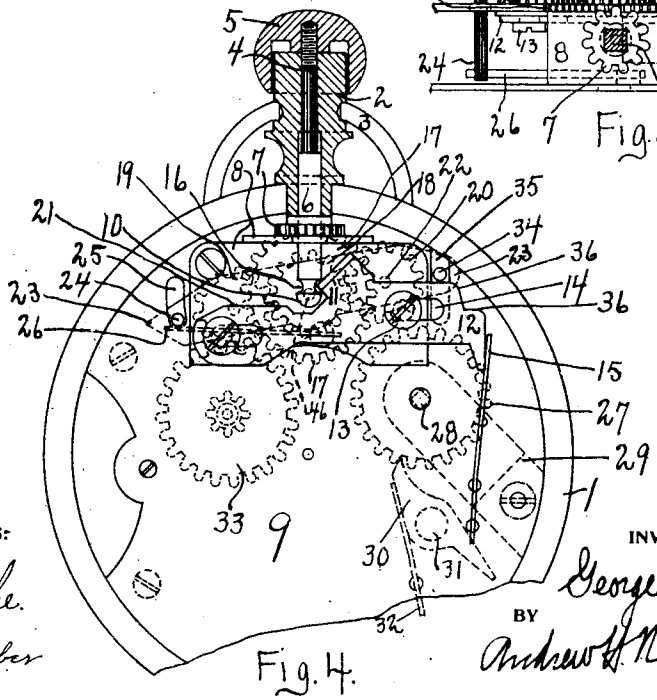

Fig. 4.

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UNITED STATES PATENT OFFICE.

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STEM WINDING AND SETTING MECHANISM FOR WATCHES.

955,336. Specification of Letters Patent. Patented Apr. 19, 1910.

Application filed February 15, 1910. Serial No. 544,087.

To all whom it may concern:

Be it known that I, GEORGE KERN, a subject of the Emperor of Germany, residing at the city of Peru, county of Lasalle, and State of Illinois, in the United States, have invented certain new and useful Improvements in Stem Winding and Setting Mechanism for Watches, of which the following is a specification.

My invention relates to improvements in the stem winding and setting mechanism for watches and has for its object the production of a stem winding and setting mechanism which can be attached to one of the movement plates of a watch, preferably to the front plate, and which is so arranged that when the stem is in its outward or normal position the main spring can be wound and when the stem is depressed to its lower position it is automatically retained in this position and disengages the stem from the winding mechanism and engages and retains the stem in operative connection with the dial or setting train of the watch; and in which it is necessary to pull the stem outward to bring it into its normal or outer position. Its further object is the production of certain novel mechanisms which will be shown and described in the specifications and pointed out in the claims.

In the drawings:—Figure 1 is a front view of a watch movement in a case showing my invention in its normal operating position, engaging the main spring winding mechanism. Fig. 2 is a front view of a watch movement in a case showing my invention in the position for actuating the dial train wheels. Fig. 3 is a rear view of the watch the back plate and back of the case being removed, and my stem winding and stem setting mechanism in its normal position engaging the main spring winding mechanism. Fig. 4 is a similar rear view of a watch showing my stem winding and setting mechanism in position for actuating the dial train wheels. Fig. 5 is a top view of Fig. 4 with the case ring head (or pendant) and crown with upper part of stem removed.

Similar numerals represent similar parts throughout the drawings.

In the drawings:—1 represents the watch case, 2 is the ring head or pendant fastened to the case 1, and 3 the ring pivotally connected to said pendant. Through a shouldered aperture in the pendant 2 passes a stem 4 having a threaded portion on which the crown 5 is fastened by means of said thread and a squared portion 6 which is slidably mounted in a pinion 7 which is positioned between the lower end of pendant 2 and a bridge or plate 8 fastened to the front movement plate 9. Adjacent to this squared portion 6 on stem 4 is formed a partially spherical shaped member 10 whose lower portion is normally in contact with an inclined plane 11 projecting from a member 12 (see Figs. 3 and 4) which member 12 is slidably mounted on the front plate 9 by means of screws 13 passing through slots 14 on member 12. Member 12 is held in its normal position shown in Figs. 1 and 3 by means of a spring 15 fastened to the front plate 9. The tension of this spring 15 against member 12 with the co-action of inclined plane 11 fastened to 12 maintains the crown 5 and stem 4 in their upper positions shown in Figs. 1 and 3. When a sufficient downward pressure is brought to bear on the crown 5 the stem 4 moves downward the spherically shaped member 10 forcing 12 to move against the tension of the spring 15 until the member 12 has moved a sufficient distance so that the spherical portion 10 of the stem 4 passes the lower edge of the inclined plane 11 when this lower edge of the inclined plane engages a notch 16 above the spherical portion 10 on stem 4, as shown in Figs. 4 and 2 and resiliently locks the stem against further end motion but permits rotation of the stem. The shape of notch 16 is such that if sufficient pulling force is put on the crown 5 member 12 will move sufficiently against the tension of spring 15 so as to permit the spherical portion 10 to pass the lower edge of inclined plane 11 and be returned to its normal position shown in Figs. 1 and 3.

Journaled on a pin 46 fastened on plate 8 and meshing with pinion 7 is a gear wheel 17 to which is concentrically fastened a gear wheel 18 which meshes with gear wheels 19 and 20 which are journaled on pins 21 and 22 respectively, which pins are fastened in a bar 23 which is also pivoted on pin 46 at a point located between pins 21 and 22. Bar 23 has a pin 24 fastened to it which projects through a slot 25 in plate 9 which contacts with the end of a spring 26 fastened to the

rear plate which retains the bar 23 in the position shown in Figs. 1 and 3 in which position the gear wheel 20 engages with the teeth of the winding gear wheel 27 which fits on the squared end of the main spring winding shaft 28, the wheel 27 being retained in position by means of a member 29 fastened to the front plate 9. Gear wheel 27 has a pawl 30 which is pivoted to the front plate 9 by means of a screw 31, and which pawl is retained by a spring 32 on 9 so that it engages its teeth and holds it against the tension of the main spring. The bar 23 being pivoted on pin 46 and the gear wheels 19 and 20 being pivoted thereto and engaged with the gear 18 journaled on said pin 46 it is evident that the bar 23 can have a rocking motion, its normal position being in Figs. 1 and 3 when the stem 4 and crown 5 are connected with the winding gear 27 and disengaged from the dial train gear 33 and its "set" position being shown in Figs. 2 and 4 when the stem and the crown 5 are engaged with the dial train gear 33 which actuates the hands of the watch and are disengaged from the winding gear 27. This oscillating motion of the bar or yoke 23 secures in my invention the "back ratcheting" feature which enables the operator to wind the watch without releasing his hold on the crown, as it is evident, that when a torsional moment is exerted on the crown 5 which winds the main spring not shown but which is fastened to the arbor 28 same as in all watches, the tendency is for the end of the bar 23 adjacent to winding wheel 27, to be forced toward the winding wheel 27 thus holding the intermediate winding wheel 20 into engagement with the winding wheel 27. When the crown 5 is rotated in a direction opposite to this just described, the tendency is for the end of the bar 23 adjacent to said winding wheel 27 to lift and raise the teeth of the intermediate winding wheel 20 over the teeth of the winding wheel 27, causing the well known "ratcheting" and permitting the crown and stem to be moved in the opposite direction to that required to winding the watch.

Fastened to and projecting from bar 23 is a pin 34 which passes through a slot 35 and engages with a cam surface 36 of the form shown on sliding member 12, (see Fig. 3.) When member 12 is in the position shown in Figs. 1 and 3 this pin 34 rests on the lower horizontal portion of cam 36 due to the action of spring 26 above described. When the member 12 is forced aside by depressing the crown 5 as above described the pin 34 is forced up the inclined surface of the cam 36 to the upper horizontal portion of said cam 36 which tilts the end of bar 23, adjacent to the dial train wheel 33, downward so that the intermediate setting gear 19 engages the dial train gear 33 when the mechanism is in position for setting the hands of the watch. When the crown 5 is again pulled out to its upper position the member 12 is brought back to its normal position shown in Figs. 1 and 3 by means of the spring 15 and the bar 23 is tilted to its normal position by means of spring 26 as above described.

From the above description it is evident that the stem 4 is normally connected with the winding mechanism and that the watch can be wound without changing the hold on the crown, and that the hand can be set by simply depressing the crown until it is locked in the setting position when it is not necessary to retain the pressure on the crown, but it only requires to be rotated, as it retains its depressed position until the setting is accomplished, when it is again pulled to its normal position. It is also evident that I can use one gear wheel in place of gear wheels 17 and 18 by simply changing the proportions of the gear wheels 10 and 20, bar 23 and gear wheel 17, but I prefer to use it as shown and described.

It will be understood, of course, that while I have here shown one form of my device, I do not wish to limit myself to the exact construction shown, but wish to have it taken in a sense diagrammatic of any and all forms of a watch stem winding and setting mechanism as come fairly within the scope of my claims.

I claim:—

1. In a stem winding and setting mechanism for watches, a movement plate, a member slidably mounted on the movement plate, an inclined plane on said member, a pendant, a stem slidably and rotatably mounted in said pendant, means on said stem co-acting with said inclined plane moving said member and forming a lock with said inclined plane.

2. In a stem winding and setting mechanism for watches, a movement plate, a member slidably mounted on the movement plate, an inclined plane on said member, a pendant, a stem slidably and rotatably mounted in said pendant, means on said stem co-acting with said inclined plane moving said member and forming a lock with said inclined plane, in combination with means for operatively connecting said stem normally with the main spring winding wheel.

3. In a stem winding and setting mechanism for watches, a movement plate, a member slidably mounted on the movement plate, an inclined plane on said member, a pendant, a stem slidably and rotatably mounted in said pendant, means on said stem co-acting with said inclined plane moving said member and forming a lock with said inclined plane, in combination with means for operatively connecting said stem normally with the main spring winding wheels, and adjustably with the dial train wheels.

4. In a stem winding and setting mechanism for watches, a movement plate, a member slidably mounted on the movement plate, an inclined plane on said member, a pendant, a stem slidably and rotatably mounted in said pendant, means on said stem co-acting with said inclined plane moving said member and forming a lock with said inclined plane, in combination with means for operatively connecting said stem normally with the main spring winding wheel, and adjustably with the dial train wheels, said means comprising a squared portion on the stem, a gear wheel slidably mounted thereon, a gear wheel journaled on a pin fastened to the movement plate engaging said gear, a bar journaled on said pin, two gear wheels journaled on pins fastened to said bar, a cam on said member and a pin projecting from said bar and co-acting with said cam.

5. In a stem winding and setting mechanism for watches, a movement plate, a member slidably mounted on the movement plate, an inclined plane on said member, a pendant, a stem slidably and rotatably mounted in said pendant, means on said stem co-acting with said inclined plane moving said member and forming a lock with said inclined plane, said means comprising a spherically shaped end on said stem, a notch and a squared portion on said stem adjacent to said end, and resilient means for maintaining said member and said stem in operative contact.

6. In a stem winding and setting mechanism for watches, a movement plate, a member slidably mounted on the movement plate, an inclined plane on said member, a pendant, a stem slidably and rotatably mounted in said pendant, means on said stem co-acting with said inclined plane moving said member and forming a lock with said inclined plane, said means comprising a spherically shaped end on said stem, a notch adjacent thereto, a squared portion on said stem and resilient means for retaining said member and said stem in operative contact.

7. In a stem winding and setting mechanism for watches, a movement plate, a member slidably mounted on the movement plate, an inclined plane and a cam formed on said member, with means for resiliently retaining said member in its normal position, a pendant, a stem slidably and rotatably mounted in said pendant, a crown removably fastened to said stem, a spherically shaped portion formed on said stem with a notch adjacent thereto, said spherical shaped portion and notch co-acting with the inclined plane to move and resiliently lock it opposite to its normal position.

8. In a stem winding and setting mechanism for watches, a movement plate, a member slidably mounted on the movement plate, an inclined plane and a cam formed on said member, with means for resiliently retaining said member in its normal position, a pendant, a stem slidably and rotatably mounted in said pendant, a crown removably fastened to said stem, a spherically shaped portion formed on said stem with a notch adjacent thereto, said spherical shaped portion and notch co-acting with the inclined plane, a squared portion on said stem, a gear wheel slidably mounted on said squared portion, a winding and setting wheel journaled on a pin on said movement plate, a bar pivoted on said pin, a pin on said bar actuated by the cam on said member and resilient means for retaining the bar in its normal position.

9. In a stem winding and setting mechanism for watches, a movement plate, a member slidably mounted on the movement plate, an inclined plane and a cam formed on said member, with means for resiliently retaining said member in its normal position, a pendant, a stem slidably and rotatably mounted in said pendant, a crown removably fastened to said stem, a spherically shaped portion formed on said stem with a notch adjacent thereto, said spherical shaped portion and notch co-acting with the inclined plane, a squared portion on said stem, a gear wheel slidably mounted on said squared portion, a winding and setting wheel journaled on a pin on said movement plate, a bar pivoted on said pin, a pin on said bar actuated by the cam on said member and resilient means for retaining the bar in its normal position, substantially as shown and described.

10. In a stem winding and setting mechanism for watches, a movement plate, a member slidably mounted on the movement plate, an inclined plane and a cam formed on said member, with means for resiliently retaining said member in its normal position, a pendant, a stem slidably and rotatably mounted in said pendant, a crown removably fastened to said stem, a spherically shaped portion formed on said stem with a notch adjacent thereto, said spherical shaped portion and notch co-acting with the inclined plane, a squared portion on said stem, a gear wheel slidably mounted on said squared portion, a winding and setting wheel journaled on a pin on said movement plate, a bar pivoted on said pin, a pin on said bar actuated by the cam on said member, an intermediate winding wheel and an intermediate setting wheel oppositely disposed engaging said winding and setting wheel, and resilient means for retaining the bar in its normal position, substantially as shown and described.

GEORGE KERN.

Witnesses:
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PAUL BRAUNS.