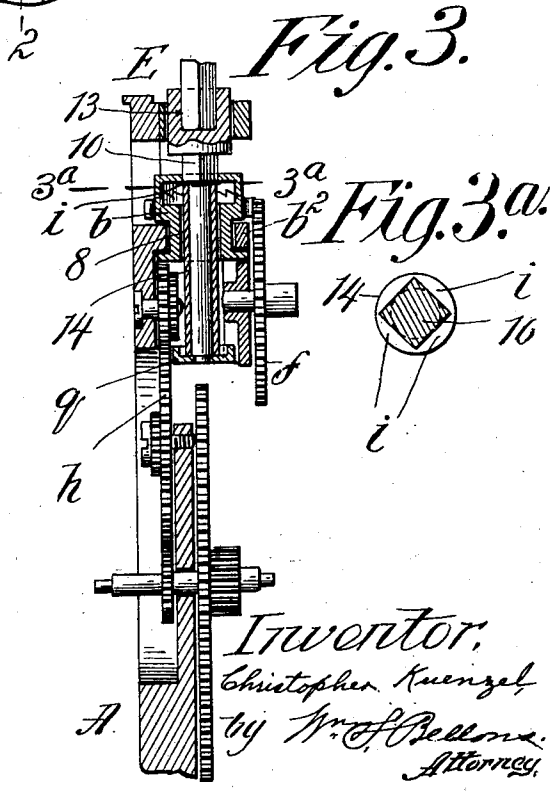
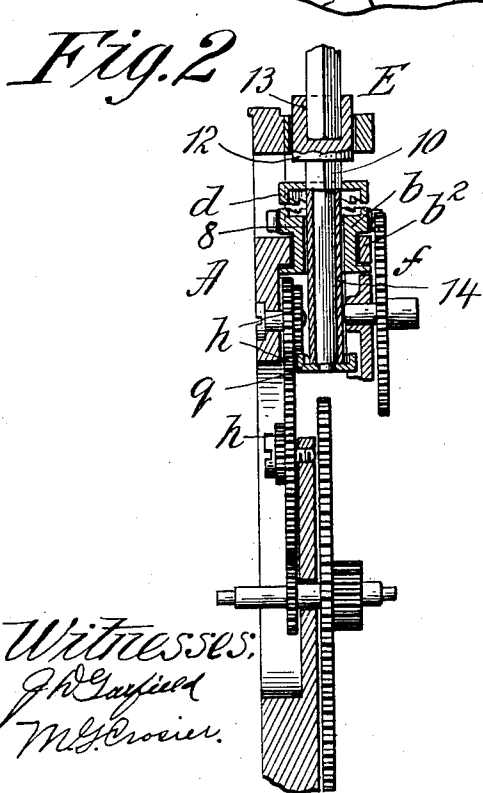
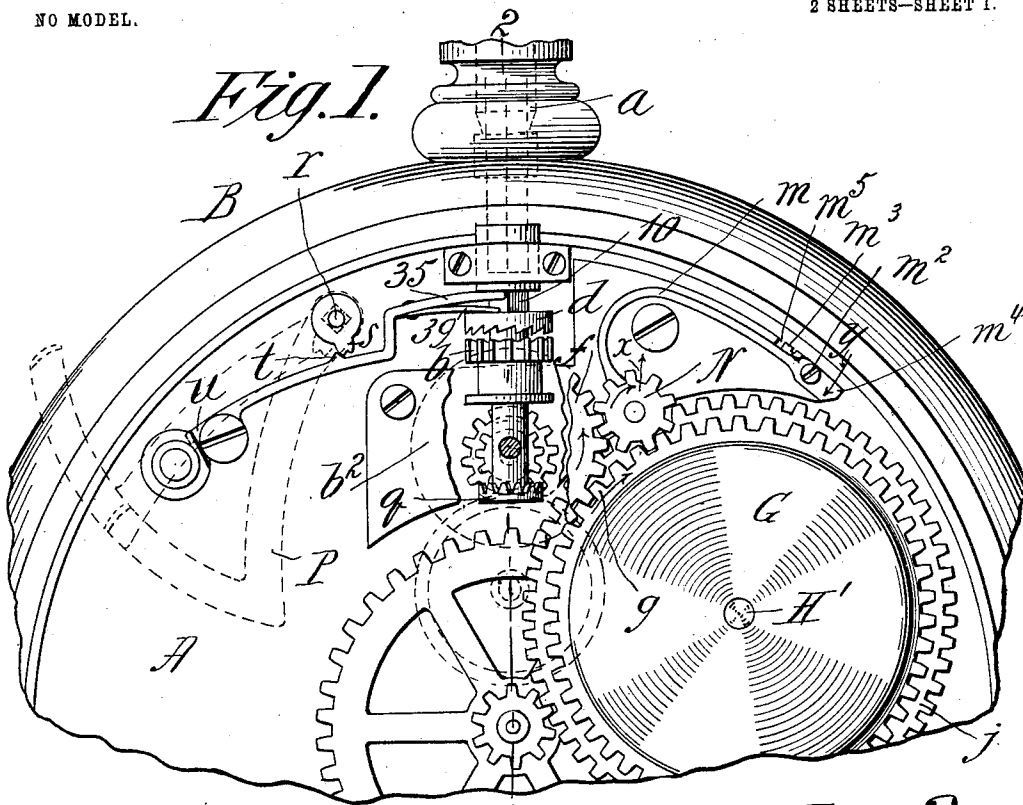


C. KUENZEL.
STEM WINDING AND SETTING WATCH.

APPLICATION FILED MAR. 10, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

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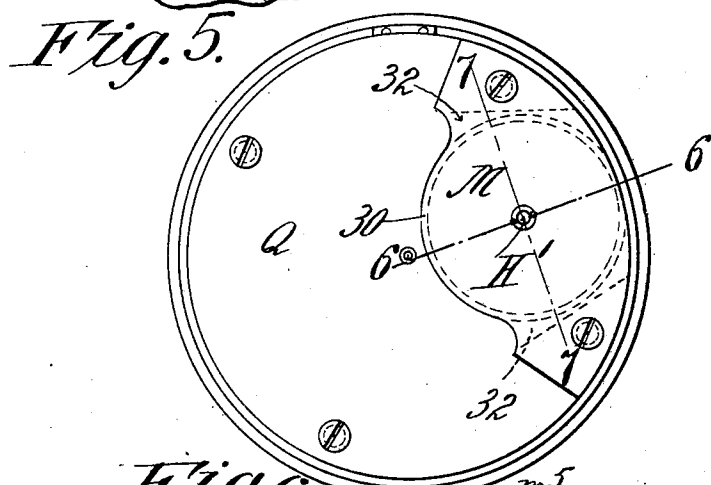
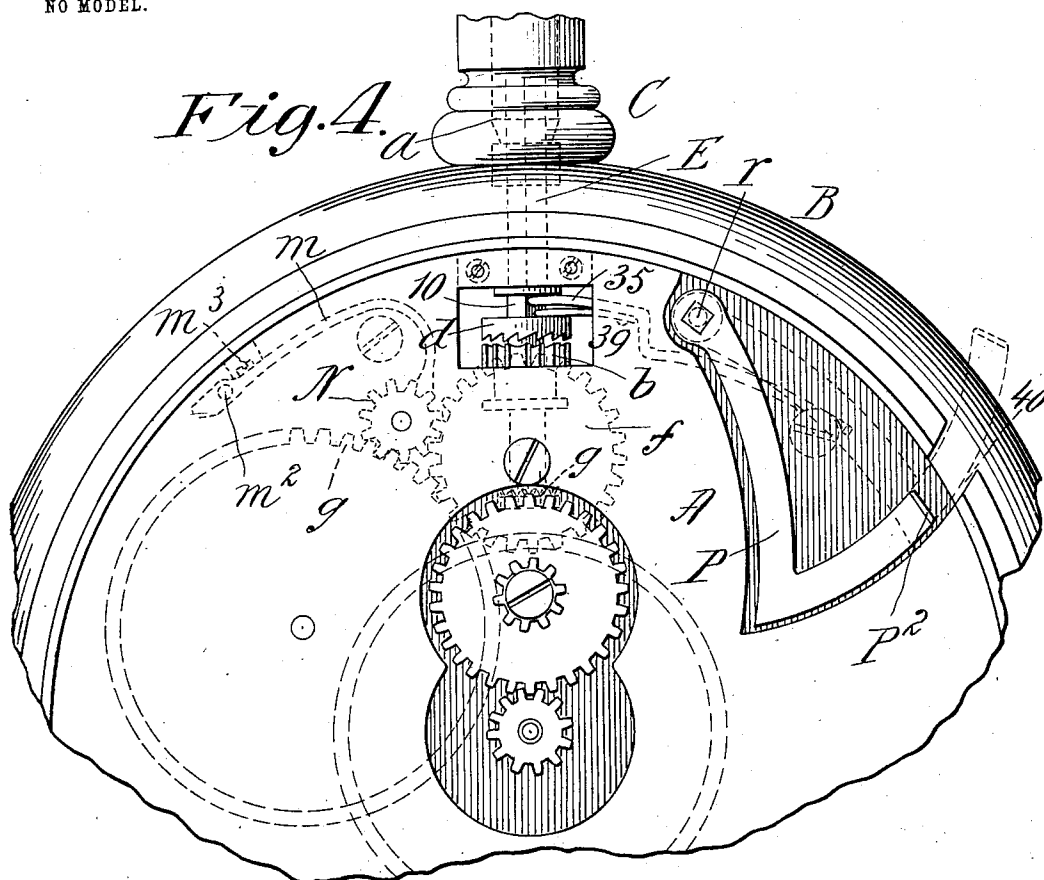
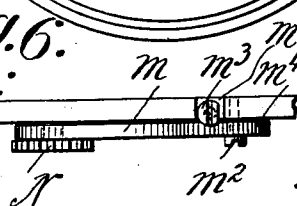


Fig. 6.

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UNITED STATES PATENT OFFICE.

CHRISTOPHER KUENZEL, OF SPRINGFIELD, MASSACHUSETTS.

STEM WINDING AND SETTING WATCH.

SPECIFICATION forming part of Letters Patent No. 739,089, dated September 15, 1903.

Application filed March 10, 1903. Serial No. 147,118. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER KUENZEL, a citizen of the United States of America, and a resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Stem Winding and Setting Watches, of which the following is a full, clear, and exact description.

This invention relates to improvements in winding and setting mechanism of watches of the class in which the winding-clutch is operated by a section of a two-part stem which by an outward movement of one of the sections insures the forcing of the clutch out of winding engagement with the barrel and the setting-pinion into setting engagement with the hand-setting train of gearing.

One object of the invention is to provide in a device of the general character exemplified in two Letters Patent of the United States granted to me February 10, 1903, a simplified combination and arrangement for increased efficiency, reliability, and durability of the stem, winding-clutch engaged by a section of the stem, and setting pinion; and another object is to combine in the stem winding and setting mechanism a lever and parts therewith connected which so safeguard the set-watch that no accidental disarrangement of the setting may transpire—for instance, during any manipulation of the stem whether for winding or otherwise; and the invention consists in the constructions and combinations of parts, all substantially as hereinafter fully described, and set forth in the claims.

In the drawings, Figure 1 is a face view, on a much enlarged scale, of the face of the watch, showing the relative arrangement of novel parts, the stem being in the position to enable the setting of the watch. Figs. 2 and 3 are sectional views as taken on the line 2 2, Fig. 1, through the winding and setting mechanism, Fig. 2 showing the parts in positions for setting corresponding to Fig. 1, while Fig. 3 shows the setting connections out of gear and the parts in connection for the winding of the watch. Fig. 4 is a face view at the opposite side from Fig. 1, showing in full lines the auxiliary setting-lever. Fig. 5 is a face view showing the plate, understood as being above the parts shown in Fig. 1, hav-

ing thereon the barrel-bridge which contributes in the composition of the present invention. Fig. 6 is a partial edge view showing the improved winding click or detent and the part on which it is carried.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the pillar-plate, and Q the top plate, of the watch, B the case and C the pendant.

E represents the stem, understood as having its outer end secured to the crown in the usual manner and playing through the common form of pendant-sleeve, (indicated by dotted lines at *a* in Figs. 1 and 4,) there being, as well known, engagement constrictive or clutch-like action between the stem and the pendant-sleeve, so that when the stem is drawn outwardly by the crown or forced inwardly with a suitable degree of pressure it may have its proper endwise motions and yet the pendant-sleeve will retain the stem in whichever position it may be placed whether for winding or setting, as the case may be.

b represents the winding-pinion, *d* the winding-clutch, *f* the winding-wheel, meshing into the teeth of the winding-pinion *b* and also having a winding-mesh with the gear-teeth *g* of the barrel G, in which the mainspring is inclosed, the same having the usual manner of connection by its one end with the inner wall of the barrel and by its other end with the winding-arbor H'. The winding-pinion *b* is restrained against endwise movement, while perfectly free for rotation by being held between a plate and a bridge *b*², (see Figs. 2 and 3,) the teeth of ratchet form to be engaged by the ratchet-like teeth of the clutch, being at the outer end of the winding-pinion. The stem E, which is made in two sections, as usual, (one of which sections is connected to the crown and plays through the pendant,) has its lower section constructed of a square formation at an upper portion 10 thereof, above which is an enlargement whereby the shoulder 12 is constituted, such enlarged portion having a square socket 13 therein receiving the outer or upper stem-section. The winding-pinion *b* has a central axial hole 8 there-through, through which plays the portion of the inner or lower stem-section, which is round below the clutch *d*. At the lower end of the

stem is the setting-pinion, shown in the form of a crown-wheel *g*, the same being arranged to disengage from and to engage with the train of setting-gearing *h*.

- 5 This winding and setting mechanism is in many respects of the same general character and having the same manner of operation as that shown in Letters Patent of the United States issued to me February 10, 1903, No. 720,259; but as a means of acquiring a shoulder *i* for the stem next under the winding-clutch *d* to engage the margins of the square hole through the winding-clutch, so that when the stem is moved endwise outwardly, the clutch will be correspondingly moved and forced out from engagement with the ratchet-teeth of the winding-pinion. A metallic sleeve or tubular shell 14 is forced onto the cylindrical or rod-like portion of the stem below the squared portion 10 thereof, a portion of the stem proper protruding downwardly beyond the lower end of the tube, receiving the rigid connection therewith of the setting-pinion.
- 25 The requirement of producing the inner stem-section in a manner to have as a feature thereof a shoulder for engagement next under the clutch, which moves endwise along the squared portion of the stem and so that the clutch may be assembled in its relative position to and about the squared portion of the stem in a very simple, inexpensive, and strong manner, is here met by making the portion of the inner stem-section below the squared clutch-engaging part 10 integral with such part 10 of reduced diameter and uniform from near the lower end up to the squared portion 10. The clutch-sleeve before the tube 14 and setting-pinion are brought to place may be easily slipped up about the squared stem part 10, and of course when the sleeve 14 is forced into its place, as shown, said sleeve having an external diameter as great as the diagonals of the squared part, the upper end of the sleeve will establish the shoulder *i* to force the clutch *d* upwardly and out of clutch with the winding-pinion when the stem has or is permitted to have its outward movement.

- The manner of action of this stem winding and setting device, comprising the combination of the stem having the squared portion 10 and the setting-pinion with the winding clutch-toothed pinion, clutch *d*, and the winding and setting gearing with which coacts the leaves of a spring which exert a separating action relatively between the enlargement shoulder 12 and the clutch, is substantially the same as has been fully described and explained in my aforesaid patent, and hence needing no further description, although it may be mentioned hereof that the construction of this clutch device made in detail, as described, is of such a character that when the watch is to be taken down to be cleaned the removal of dust and dirt can be satisfactorily accomplished without disconnecting the clutch, sleeve, and winding and setting pin-

ions from their engagements or fastenings with the stem.

The novel constructions, arrangements, or devices pertaining to and comprised in the barrel and its click will be now described.

The barrel has a flange formed with gear-teeth *g*. The flange projected from the rim of the barrel, constructed with gear-teeth *g* and serving to insure the rotation of the barrel when the winding-wheel *f* is rotated by the turning of the stem and winding-pinion clutched therewith, has the gear-teeth thereof also to serve to receive the engagement of what I term the "click" *N*, which is shown as constituted by a pinion which is pivotally carried in the plane of and at the crotch between the meshing portions of the winding-wheel *f* and the spur-toothed wheel and barrel-flange *g* upon and by the curved spring click-carrier *m*, the same being indicated as having the shank of the pivot-screw *m*² passed through it at a short distance within its end opposite from the click-pinion *N*, and a *D*-headed screw *m*³, set in a recess *m*⁵ in the rim of the bridge or piece on which the click-carrier is supported, holds the said spring click-carrier under the proper tension.

When the watch is being wound in the direction of the arrows, Fig. 1, on the winding-wheel *f* and toothed barrel, there will be a freeing tendency in the direction of the arrow *x* imparted to the click-pinion *N*, whereby it will not obstruct in any degree the winding action, and yet immediately the winding force is terminated the click-pinion will resume its positive engagement, acting as a clog-wheel between the gears *f* and *g*.

Should it be desired to "let down" the mainspring, which letting down is resisted under and during all ordinary conditions by the pinion-click *N*, which serves as a pawl to a ratchet, the *D*-headed screw *m*³ may be turned so as to disengage the spring-carrier for the pinion-click, and if then the parts are bound or jammed in any degree in the crotch of the meshing gears *f* and *g* by slightly pressing inwardly in the direction of the arrow *y*, Fig. 1, on the lower extremity *m*⁴ of the carrier *m*, the latter will be induced to jump out from its position of click engagement with the teeth of the aforesaid wheels.

The barrel-wheel *j* of course has connection in the ordinary manner with the center pinion of the watch, and the general mode of winding action is the same as common and well known in watches.

Reverting to the setting mechanism, it is to be understood that when the crown and outer section of the stem *E* are outwardly drawn the spring 35 moves the inner stem-section outwardly, causing by the shoulder engagement *i* clutch *d* to disengage the winding-pinion and the setting-pinion to come into engagement with the winding-train.

The auxiliary lever *P* and novel devices therewith connected and combined with the winding and setting mechanism already de-

scribed in detail are such that a stem-winding watch is provided in which when the lever is in a given position the usual outward movement of the crown and stem will not result in bringing the parts into the setting engagement, the latter being accomplished by a certain motion imparted to the lever, or in which when the lever is inwardly swung and its connected parts are rendered non-effective on the winding and setting device, whereupon the parts are brought to the setting position by the outward forcible action of the crown and stem. The lever P swings from a pivot *r* at one side of the plate, the pivot being journaled through the plate and has affixed thereto at its opposite end the dog *s*, the same being shown as provided with a notch in its end arranged to coact with a V-shaped projection *t* at the back of the spring 35, which is secured or anchored at *u* endwise opposite from the end of the spring which bears and reacts outwardly against the outer stem-section and which carries the secondary spring-leaf 39, which is under tension and reacts in the inward direction against the clutch *d*. When the lever P is swung so that its lip P² is about at the niche 40 at the edge of the watch, the notch of the dog will have ridden over the V-shaped projection of the spring and so crowded the latter inwardly that no matter what the outward drawing of the crown and outer stem-section may be the inner stem-section will not be thrown outwardly also, and the setting-pinion will not enter engagement with the setting-train until the lever has been swung outwardly to the position shown by the dotted lines, which done of course the spring will be permitted to have its usual action of throwing the parts into the setting engagement. By having the lever swung to the inner position shown, where it is inaccessible, the watch is or may be rendered a pendant-setting watch. This device just described constitutes an additional safeguarding of the watch-setting means, so that the watch, which may be regulated to run closely, cannot have any change in the relative positions of the hands except as the owner of the watch intentionally permits and accomplishes by moving the lever to carry the dog away from its restraining engagement with the spring.

I claim—

1. In a stem winding and setting watch in combination, the winding-pinion having a fixed position for rotation and the winding-clutch at the outer side thereof, the stem having the polygonal portion 10 with which the correspondingly-apertured clutch engages and having therebelow a rod-like portion of reduced diameter, the tubular section 14, closely fitting the reduced portion of the stem, the upper end thereof constituting the shoulder *i* at the junction of the tubular section with the polygonal portion of the stem, the setting-pinion affixed at the inner end of the stem, the winding-pinion having at the

outer end clutched teeth and having a central aperture loosely surrounding said tubular stem-section and the winding and the setting gearing with which the winding and setting pinions are respectively in engagement.

2. In a stem winding and setting watch the combination with the stem, the winding-pinion, clutch engageable with the stem, the winding spur-wheel and the barrel having spur-teeth in mesh with the winding-wheel, of a click comprising a pinion, a spring-arm on which said pinion-click is pivotally mounted, said pinion-click having normally its location for engagement adjacent the intermeshing portions of the teeth of the winding-wheel and barrel, the teeth of said pinion engaging the barrel and winding-wheel teeth, substantially as described.

3. In a stem winding and setting watch, the combination with the stem, the winding-pinion, the winding spur-wheel and the barrel having spur-teeth in mesh with the winding-wheel, of a click constituted by a spur-pinion, a spring-arm on which said pinion-click is pivotally mounted, said spring-arm having near one end the pivot-screw passed there-through and into a supporting part therefor, the screw *m*³ having a tensioning engagement with said spring-arm, and the spring-arm-supported pinion-click having its location for engagement in the teeth of both the winding-wheel and the barrel, substantially as and for the purposes set forth.

4. In a stem winding and setting watch, in combination, the stem, the winding-pinion, clutch engageable with the stem, and the clutch having an engagement with the stem whereby outward motion of the latter will force the clutch to disengage from the winding-pinion, a spring exerting an outward-forcing action relatively to the stem and having a position of engagement with the latter, a dog movable to engage and disengage said spring whereby, when engaging the spring will be non-effective to exert its outward stem-forcing action, the setting-pinion carried by the stem and coöperating with the setting-train, and winding-gearing with which the winding-pinion is in mesh.

5. In a watch winding and setting mechanism, in combination, the stem, the winding-pinion, clutch engageable with the stem, and the stem having an endwise-forcing engagement with the clutch as described, the spring 35 having one end stationary and having its free end coöperating for an outward-forcing action against the spring, a lever pivotally mounted and having attached to its pivot the dog *s*, arranged to engage and disengage from said spring, substantially as and for the purpose set forth.

Signed by me at Springfield, Massachusetts, in presence of two subscribing witnesses.

CHRISTOPHER KUENZEL.

Witnesses:

WM. S. BELLOWES,
A. V. LEAHY.