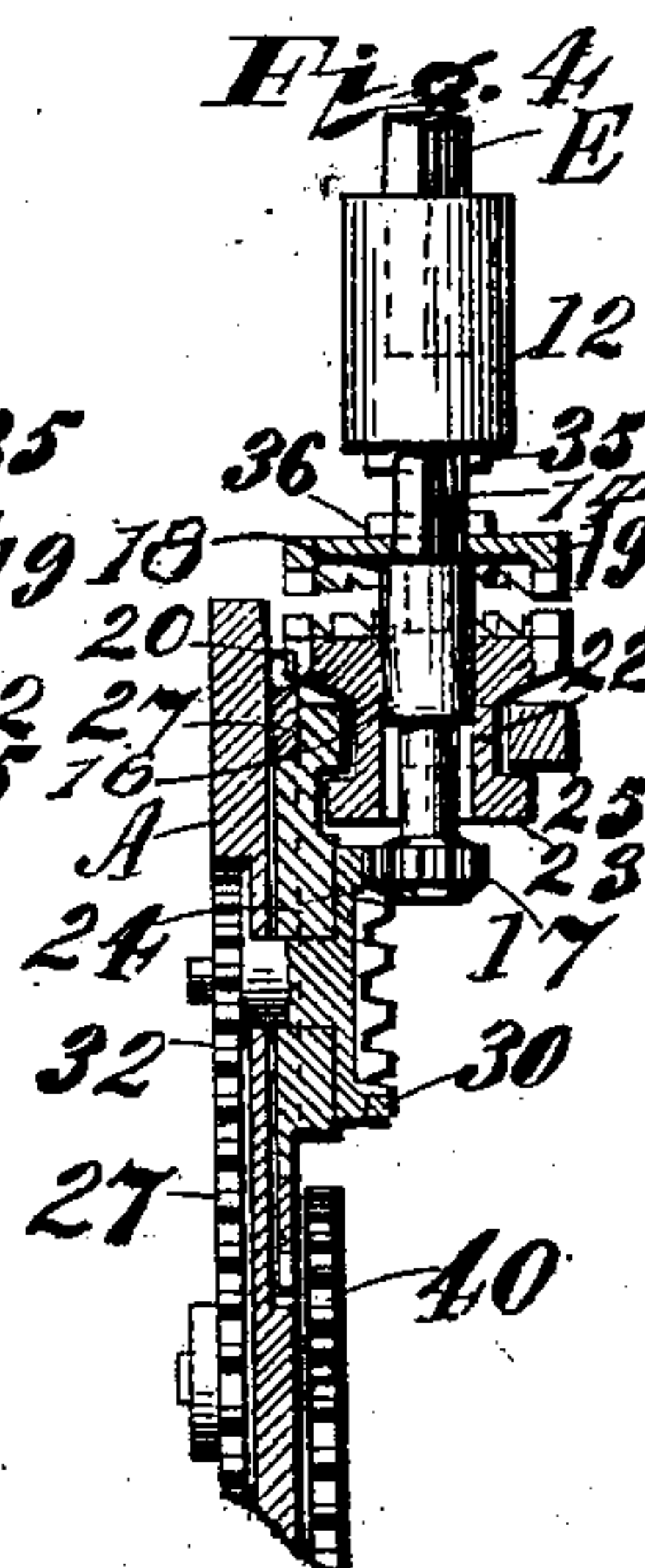
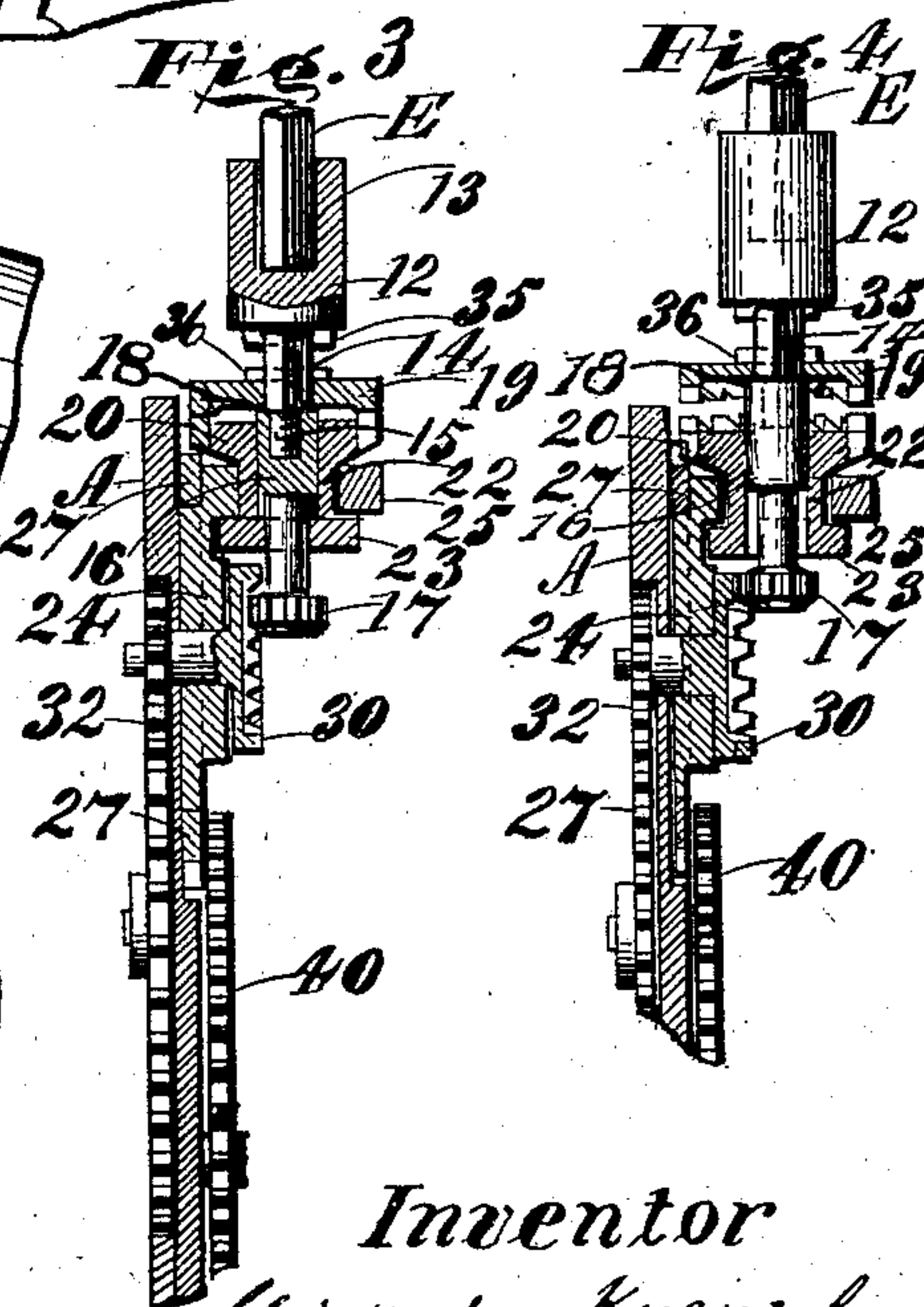
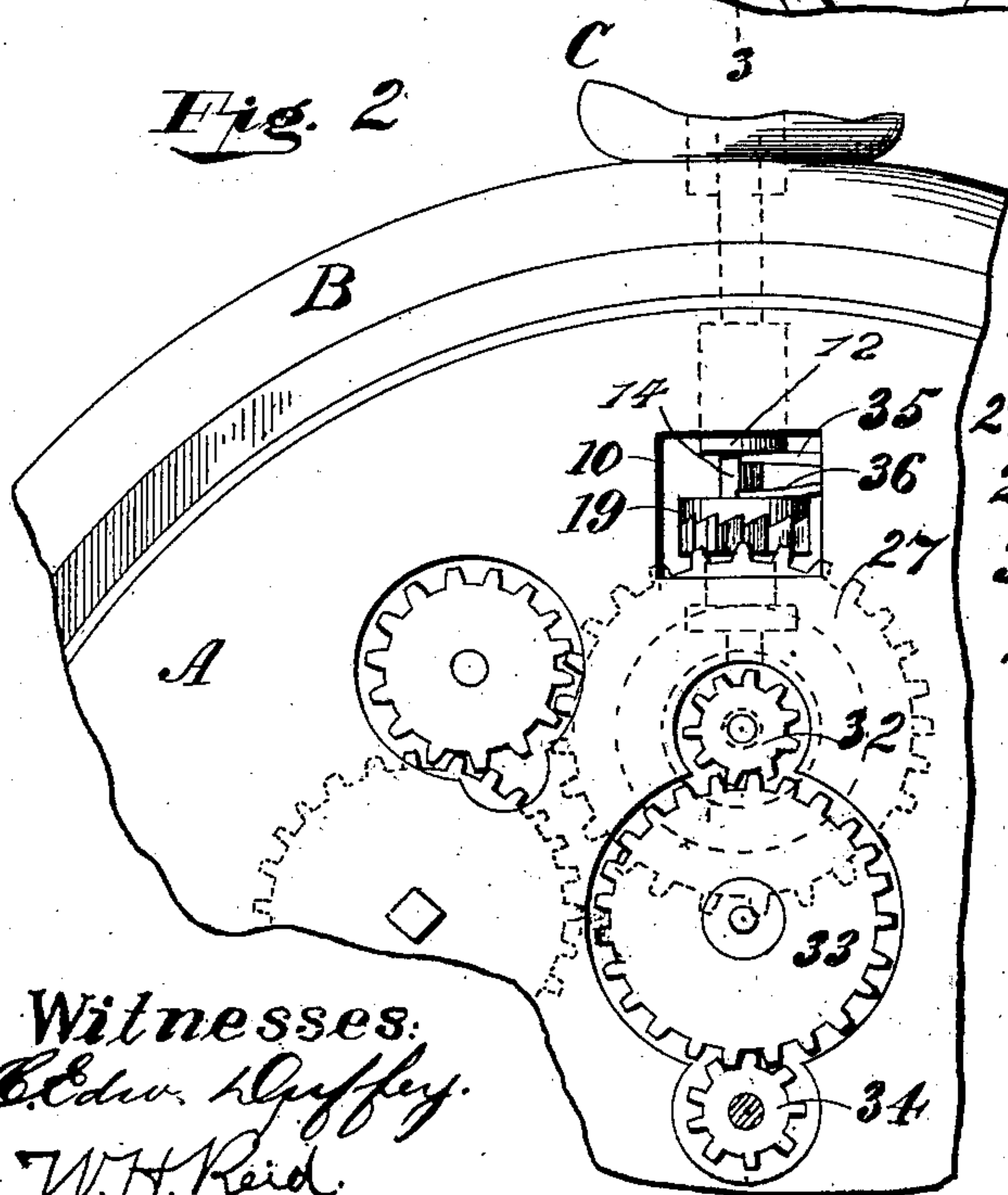
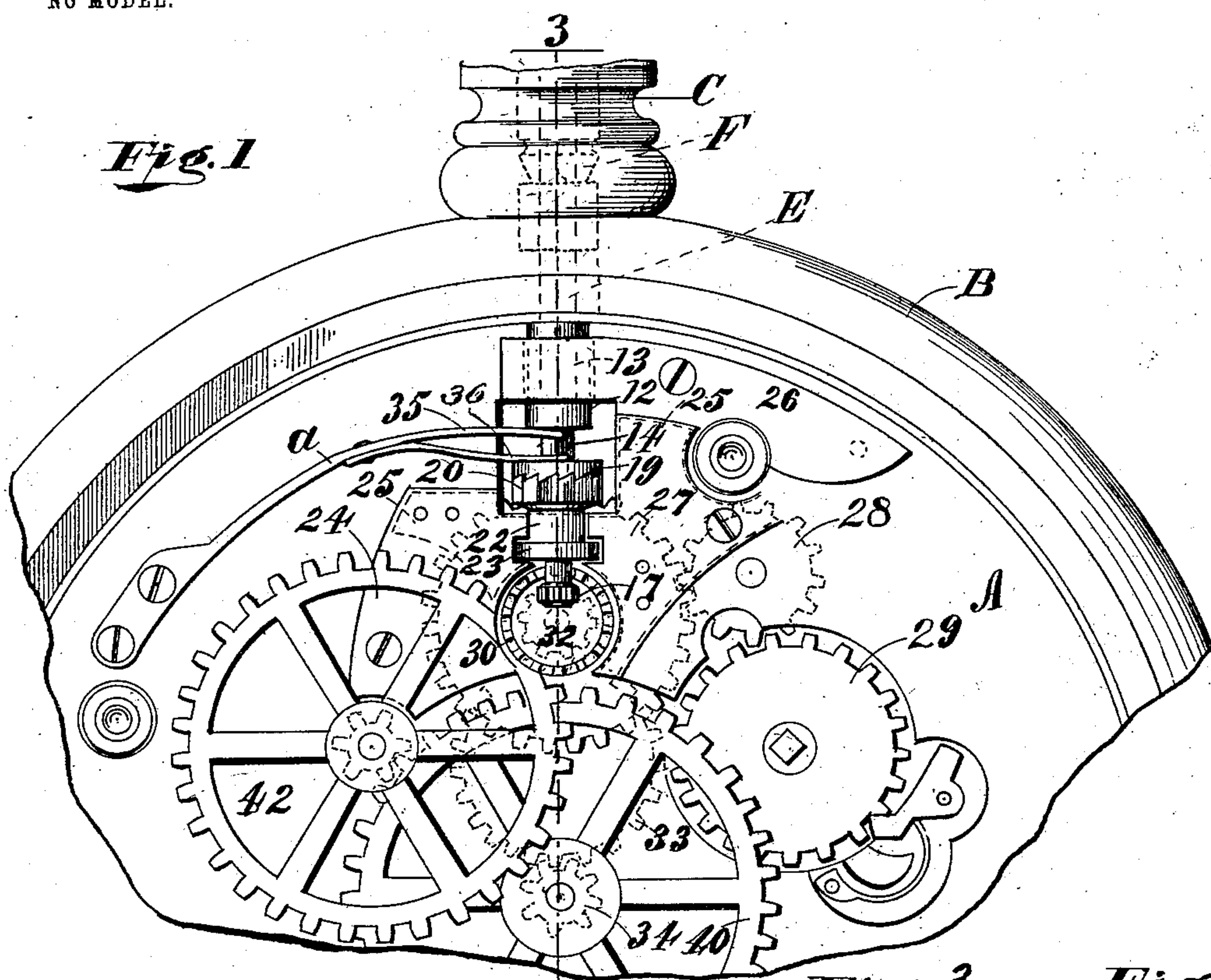


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STEM WINDING AND SETTING WATCH.

APPLICATION FILED JULY 29, 1902.

NO MODEL.



Witnesses:  
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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. 720,259, dated February 10, 1903.

Application filed July 29, 1902. Serial No. 117,559. (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 Winding and Setting Mechanism for Watches, of which the following is a full, clear, and exact description.

10 This invention relates to improvements in watch winding and setting mechanisms of the class which is adapted to be operated by the crown and stem, which latter has an endwise movement through the pendant, the mechanism being normally in the winding position, but capable of having the setting position by an outward endwise movement of the stem, whereupon the device is out of clutch for the winding action.

20 A principal object of the present invention is to so construct and arrange the pendant winding and setting mechanism that it is applicable on watches of the more common form of American manufacture, more particularly those having what are known as the "eighteen size full-plate" movements, and is as well applicable for movements in hunting-cases as those for open-case watches, the novel winding and setting mechanism not interfering with or being affected by the usual endwise inward movement of the stem which is required to inwardly press and release the hunting-case spring snap or catch.

35 Another object of the invention is to provide a generally-improved construction and arrangement of the winding and setting mechanism which is comparatively simple, durable, direct in its action, easy of assemblage and displacement, and in no manner liable to become deranged after protracted use; and the invention consists in the constructions, combinations, and arrangements of parts, all substantially as hereinafter fully described, and set forth in the claims.

45 The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a face view thereof, the parts of the winding and setting mechanism being shown as located in close proximity to the back plate of the watch, the parts being shown as in the winding position. Fig. 2 is a view

of the back or rear side of the back plate opposite from that seen in Fig. 1, showing a portion of the mechanism as there exposed. Fig. 3 is a sectional view taken on the line 3 3, Fig. 1, no portion of the watchcase or pendant being here shown. Fig. 4 is a sectional view somewhat similar to Fig. 3, but showing the parts as changed from the positions for winding to the positions for setting.

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

In the drawings, A represents the back plate of the watch, the inner or front side being seen in Fig. 1 and the rear side in Fig. 2.

B represents the case, C the pendant, and E represents the stem, understood as secured to the crown in the usual way and playing through the common form of pendant-sleeve, (indicated by the dotted line at F in Fig. 1,) there being, as well known, engagement devices between the pendant-sleeve and the endwise-movable stem, so that when the crown is drawn out or forced in suitably forcibly it may have its desired endwise motions; but the pendant-sleeve serves to retain the stem as the stem may be forcibly placed for winding or setting, as the case may be. The back plate has the aperture 10 extended entirely through its thickness, the same being within and in line with the pendant, and located in this aperture and adjacent thereto are parts arranged and united to move as one, being in substance a continuation of the pendant-stem being engaged by the stem, but capable of an endwise movement independently thereof. These parts in continuation of the stem, and which may be termed the "inner stem-section," consist of a section 12, the upper cylindrical portion of which has the squared axial socket 13, in which the lower end portion of the stem has an engagement, whereby the rotation of the stem will rotate the part 12, and yet whereby the stem may move endwise independently of the said part 12, and said part or section 12 has inwardly beyond it and as a part thereof the squared portion 14 of smaller diameter, said portion 14 being longitudinally continued in the still further attenuated round screw-threaded portion 15, with which screw engages the upper end portion of a spindle-section 16, the lower end of



which has the setting-pinion 17 as a part thereof, it being perceived that the external diameter of the part 16 is greater than the greatest cross-sectional dimension of the squared portion 14, so that the shoulder 18 is produced to engage the under side of the winding-clutch 19, which latter has a square central aperture for a sliding fit about said squared part 14.

Surrounding the round portion 16 is the winding-pinion 20, this pinion and its sleeve extension 22 having the axial opening there-through round for freedom of rotation about the round stem part 16, and said sleeve portion 22 has at its inner end the external flange 23, which is engaged in the shoulders in the recess shown therefor in the plate, so that the winding-pinion and its sleeve portion can rotate only in a given position and without axial movement, and there are three bridge-plates provided for holding these last-described parts in their proper places, those 24 and 26 being shown by full lines in Fig. 1, while the upper bridge shown in the section at 25 in Fig. 3 is indicated by the dotted lines 25 in Fig. 1.

In a suitable depression in the upper or inner face of the back plate rotatable about a low hub is the annular winding-wheel 27, its plane of rotation being right angular to that of the winding-pinion, the spur-teeth of the one meshing into the spur-teeth of the other, so that the rotation of the winding-pinion will rotate the winding-wheel, driving the intermediate wheel 28 and the winding-ratchet 29.

The normal position of the inner stem-section, which at its lower or inner end carries the setting spur-pinion 17, is such that this pinion has its location inside of the teeth of the crown-wheel 30, which crown-wheel is affixed on an arbor extending through to the rear side of the back plate and there having affixed thereto what is termed the "intermediate setting-wheel" 32, which is in mesh with the minute-wheel 33, which in turn is in mesh with the cannon-pinion 34.

a represents a two-leaf spring, the stronger spring member 35 thereof exerting a comparatively considerable force against the shoulder at the junction of the stem-section 12 and the squared stem-section 14, while the spring-leaf 36, of lighter stress and in stress between the aforesaid shoulders and the upper face of the winding-clutch 19, is of sufficient power to keep the clutch 19 in place normally, so that when the stem is turned in one direction, thereby rotating the clutch member 19, it will correspondingly rotate the winding-pinion for winding the watch, and yet when the stem is turned in the opposite direction, carrying the clutch member around therewith, the latter may have the "ratchet-back" action—that is, its ratchet-wheel shall ride over the ratchet-teeth of the winding-pinion without effect for rotation thereon—

the light spring permitting. The parts being in the winding position shown in Figs. 1, 2, and 3 of the drawings, it is only necessary, of course, to turn the stem by the crown to wind the watch, which action will be, as usual, without effect upon the setting-gearing; but on desiring to set the watch the outer stem is drawn forcibly outwardly by the crown, and the stronger leaf 35 of the spring engaging under the shoulder of the portion 12 of the inner stem-section forces the latter section endwise upwardly or outwardly, and the aforementioned shouldered part 18, constituted by the upper end of the portion 16 of the inner stem-section, engaging the under face of the winding-clutch 19 carries the latter clutch against the comparatively light stress of its spring-leaf 36 upwardly out of clutch with the winding-pinion, the setting-pinion 17 at this time being moved outwardly or upwardly into engagement with the teeth of the crown-wheel 30, connected in the setting-gearing of the watch. The spring 35 causing when the outer stem-section E is outwardly drawn the lower stem-section to follow it, as rendered manifest, it is of course to be understood that upon the inward forcing of the stem-section E its inner portion by being in bearing against the bottom of the socket 13 in the part 12 of the inner stem-section will force the latter section downwardly or inwardly to bring the parts into the winding position again. The inner stem-section, comprising the cylindrical part 12, the squared extension, and round threaded extremity 15, as to the one part, and the spindle-section 16, having the setting-pinion 17, as to the other part, are formed as thus set forth for the purposes of assemblage and combination with the winding-pinion and its cylindrically-bored sleeve 22 and for the engagement with the winding-clutch member 19, as described and shown.

Taking into account that the drawings here provided are very much enlarged, it will be perceived that the novel portions of the winding and setting devices, more especially those comprised in the inner stem-section made as described, the winding-clutch, the winding-pinion, and its sleeve 22 are parts of very slight diametrical extent as well as radial extent and of very compact arrangement and requiring for occupancy space of very slight height above and beyond the back plate, so that what are termed the "center wheel" and the "third wheel" (indicated at 40 and 42 of the drawings in Fig. 1 and in part in Fig. 3) may have their positions the same as now usually given them in the most common forms of full-plate watches closely next to the winding and setting mechanism and to the back plate, which would not be possible if it were required that the winding-clutch 19 worked from within the winding-pinion outwardly toward it, as common in pendant winding and setting mechanisms at present in vogue, instead of, as here shown, having such wind-



ing-clutch working from the outer side of the winding-pinion inwardly toward the latter, and it will be here appreciated that such of the mechanism—viz., the shoulder 18—for operating the clutch 19 and setting-pinion which is not internally located—that is to say, the springs 35 and 36—have their positions at an outer portion of the watch-movement plate, so as not to interfere in any way with or be interfered with by the center and minute wheels of the ordinary movement, and if external clutch-operating devices were to be provided to operate on the winding-pinion clutch located and movable inside of the winding-pinion in a watch such as here referred to its necessary position would be in direct interference with the center and third wheels and barrel. This winding and setting mechanism is susceptible when in the normal winding position of having the stem operate from the pendant to inwardly force and release in the usual way the spring-catch of an ordinary hunting-case watch, for it will be perceived that with the parts in the positions shown in Figs. 1, 2, and 3 the inward pressure on the stem as required for the release of a watch-case spring-catch will be without effect on either the winding or the setting mechanism, there being merely incidentally to the extreme inward thrust of the stem the moving of the setting-pinion 17 inwardly a little farther away from its position of proximity to the teeth of the crown-wheel 30.

An advantage arising from the construction and arrangement in the watch-movement of the mechanism herein described which will be especially appreciable to watch-manufacturers will be found in the fact that when the movement is set up and adjusted in the factory and while held in a movement-box before being put into the watchcase having the pendant and outer stem-section E the sides of the movement-box will retain the inner stem-section in proper position to insure the keeping of the winding-clutch in engagement.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a pendant watch winding and setting mechanism in combination, the winding-pinion having a fixed position for rotation, and the winding-clutch at the outer side thereof, the stem endwise movable freely through and non-engaged with the winding-pinion, and movable freely endwise through the clutch but having a rotating engagement with the clutch, and having a shoulder for engagement with the inner side of said clutch, whereby its outward movement outwardly forces such clutch, and having at its inner end the setting-pinion, the winding-gearing with which the winding-pinion is in constant engagement, the setting-gearing with and from which the stem-carried setting-pinion engages and dis-

engages and a spring for forcing the clutch into engagement with the winding-pinion.

2. In a pendant watch winding and setting mechanism, in combination, the winding-pinion having a fixed position for rotation, and having clutch-teeth at its outer side, and the winding-clutch at the outer side of the winding-pinion, having a square central aperture, the stem, having a squared portion fitted and endwise movable through the squared aperture of the clutch member, freely endwise and rotatably movable through the winding-pinion, and having a shoulder at its portion within the pinion for an engagement with the inner side of the winding-clutch, whereby its outward movement outwardly forces such clutch, and having at its inner end the setting-pinion, the winding-gearing with which the winding-pinion is in constant engagement, and the setting-gearing with and from which the stem-carried setting-pinion engages and disengages, and springs exerting, respectively, an outward pressure on the stem and an inward pressure on the winding-clutch.

3. In a pendant watch winding and setting mechanism, in combination, the winding-pinion having a fixed position for rotation, and having clutch-teeth at its outer side, and the winding-clutch at the outer side of the winding-pinion having a central polygonal aperture, the inner stem-section having the outer end enlargement 12, with a socket therein and a portion endwise movable freely and non-engaged through the winding-pinion, having at its portion below the clutch a shoulder for an engagement with the inner side of the clutch, whereby its outward movement outwardly forces such clutch, and having its portion outside of said shoulder of polygonal form fitting and longitudinally movable through the aperture in the clutch, having at its inner end the setting-pinion, and said stem having at its outer portion a polygonal socket, the winding-gearing with which the winding-pinion is in constant engagement, the setting-gearing with which the stem-carried setting-pinion engages and disengages, the outer stem-section E engaging in the upper end socket of the inner stem-section, and the respectively heavy and light springs bearing outwardly against the enlargement 12 of the inner stem-section, and inwardly against the winding-clutch.

4. In a pendant watch winding and setting mechanism in combination, the winding-pinion having a fixed position for rotation and the winding-clutch at the outer side thereof, the stem endwise movable through, and non-rotatably engaged with, the winding-pinion, and consisting of the two screw-engaged parts, the first of which comprises the portion 12, the squared smaller extension 14, and the screw-threaded, still smaller, extremity 15, and the other comprising the spindle-section

tion 16 having the screw-socketed part diametrically larger than the aforesaid squared part 14, whereby the shoulder 18 is produced at the junction of such parts, and said part  
5 16 having at its lower end the setting-pinion 17, the winding-gearing with which the winding-pinion is in constant engagement and the setting-gearing with and from which the

stem-carried setting-pinion engages and disengages.

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

CHRISTOPHER KUENZEL.

Witnesses:

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