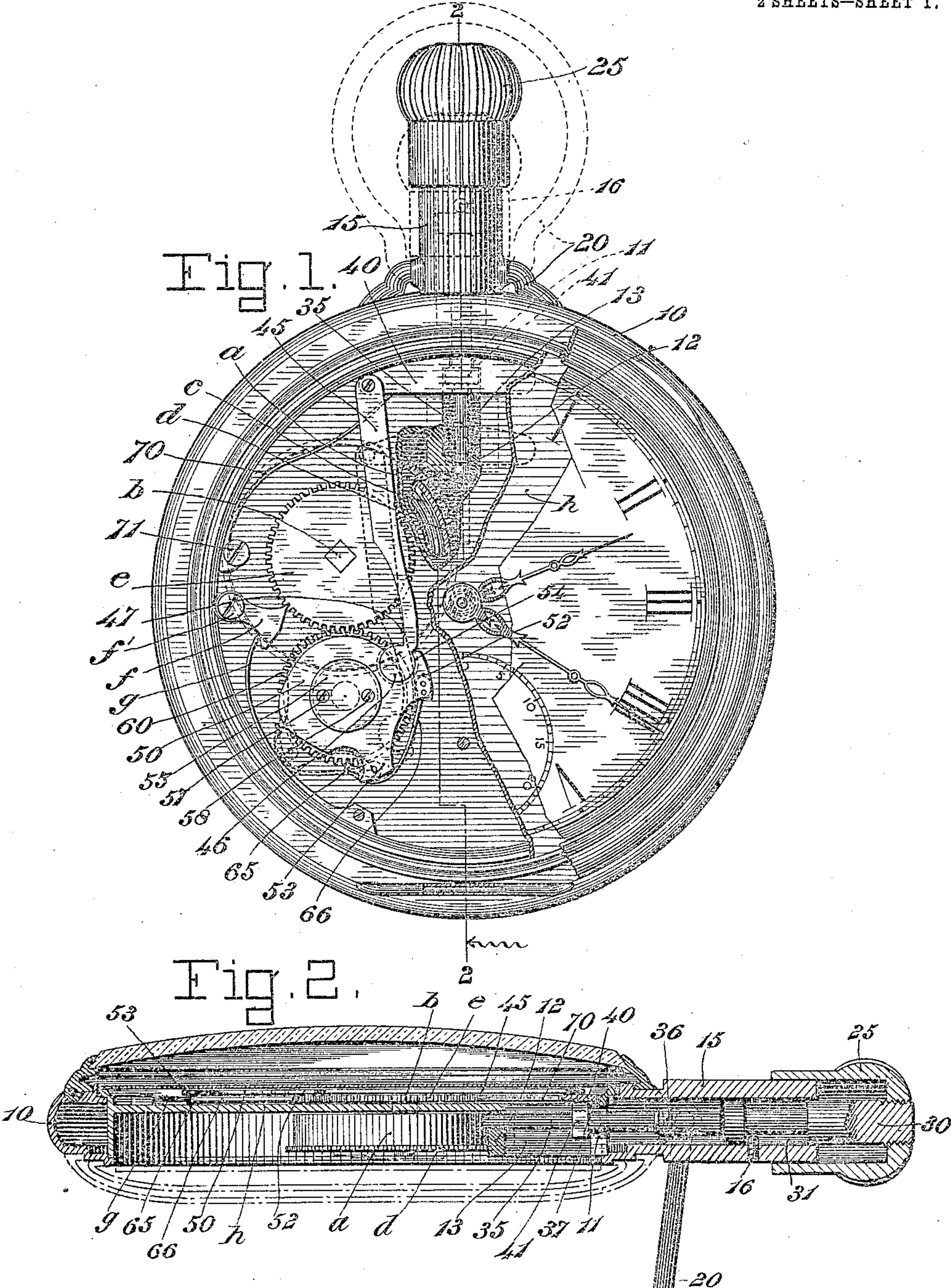


A. PLEAN.
 STEM WINDING MECHANISM FOR WATCHES.
 APPLICATION FILED NOV. 13, 1908.

939,081.

Patented Nov. 2, 1909.
 2 SHEETS—SHEET 1.



Witnesses
Harry King
W. A. Baldwin

Inventor
A. Plean
 By *F. C. Jones*
 Attorney

A. PLEAN.

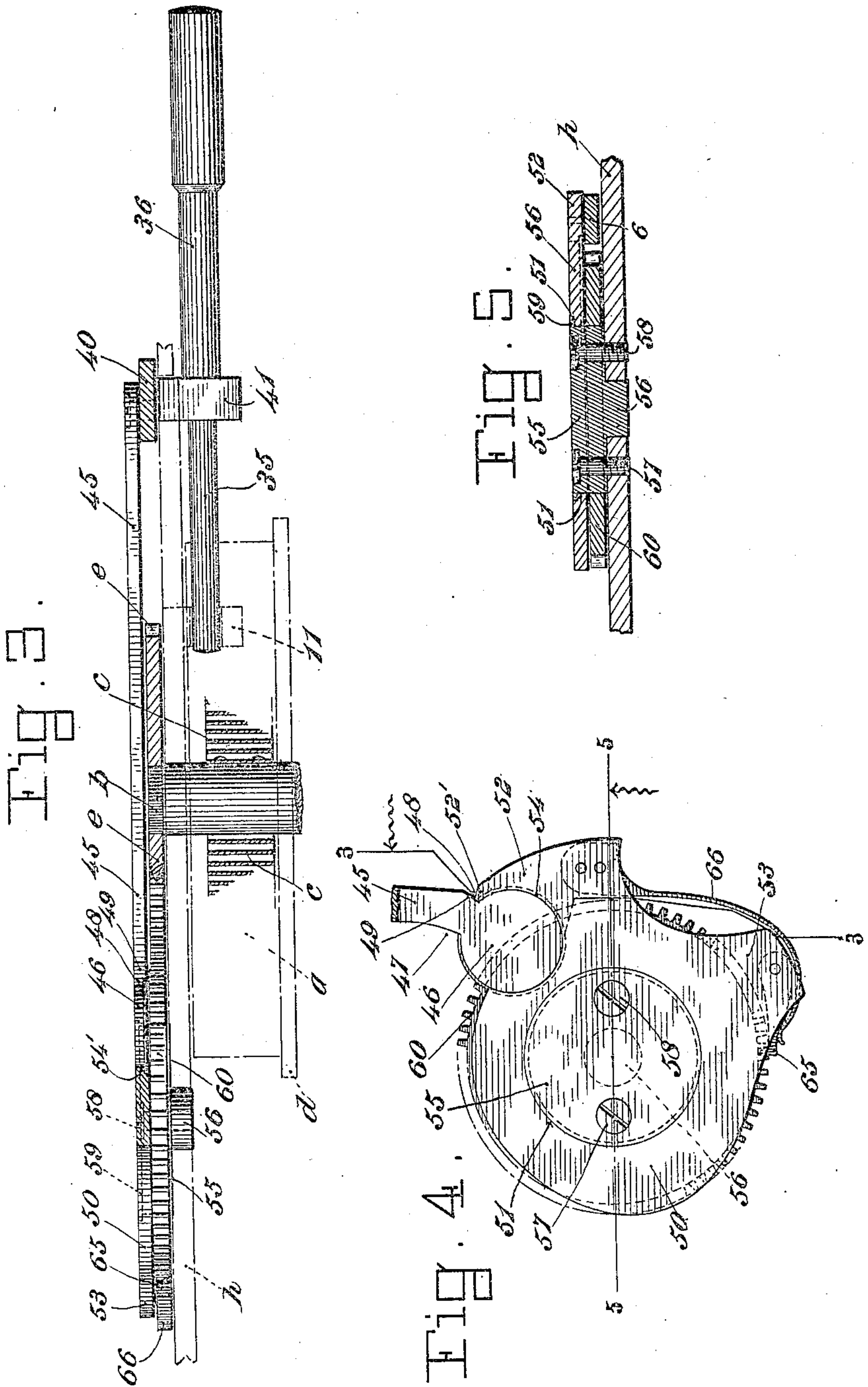
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UNITED STATES PATENT OFFICE.

ABRAHAM PLEAN, OF NEW YORK, N. Y.

STEM-WINDING MECHANISM FOR WATCHES.

939,081.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed November 13, 1908. Serial No. 462,404.

To all whom it may concern:

Be it known that I, ABRAHAM PLEAN, a subject of the Czar of Russia, and residing in the borough of Brooklyn, in the city of New York, in the county of Kings, in the State of New York, have invented certain new and useful Improvements in Stem-Winding Mechanisms for Watches, whereof the following is a specification.

The principal object of this invention is to provide a stem winding mechanism practically operative single-handed, that is to say the watch may be conveniently wound while held in one hand without assistance from the other.

Another object of the invention is to provide a stem winding mechanism simple in construction and composed of few parts and therefore economical to make.

Figure 1 of the accompanying drawings represents on an enlarged scale a plan view of an open faced watch embodying one form of this invention, portions of the crystal and its supporting frame and of the dial and parts of the going train being broken away to show the interior construction. Fig. 2 represents also on an enlarged scale a vertical, diametrical section on line 2—2 of Fig. 1 including a longitudinal section of the case stem or pendant. Fig. 3 represents on a greatly enlarged scale a transverse section on line 3—3 of Fig. 4 showing the main spring and this improved winding mechanism in operative connection therewith. Fig. 4 represents on the same scale as Fig. 3 a plan view of the winding wheel of the spring drum and those parts of this improved winding mechanism immediately connected therewith. Fig. 5 represents a transverse section thereof likewise greatly enlarged on line 5—5 of Fig. 4.

The same reference numbers indicate corresponding parts in the different figures.

This invention may be embodied in or adapted to watches of various types.

In the form of embodiment herein illustrated, merely as an example, the improvement is shown in connection with a well known type of American watch, whereof the watch movement comprises as usual, a going barrel *a*, a barrel arbor *b*, a main spring *c* secured to said arbor and barrel, a going wheel *d*, a main winding wheel *e* secured to the barrel arbor, and a check pawl *f* pivoted at *f'* with spring *g* for controlling the winding wheel *e*; these parts being of the ordinary or usual construction.

The watch movement or works as shown are inclosed in an ordinary open-faced case 10, having a hollow pendant or case stem 15 to which the watch bow 20 is secured in the usual manner. The pendant and bow are shown as slightly elongated beyond the ordinary length of these parts, but this exceptional length is not absolutely necessary. The pendant 15 is provided on its interior with a stop 16 in the form of a screw or otherwise.

A hollow crown or knob 25 is adapted to fit over and slide on the pendant 15. This crown moves in and out like a push button in the operation of winding the watch as hereinafter described. The usual enlargement of the crown and the fluting or milling thereof may be omitted, as no turning function is required.

A push pin normally projected by a spring tension through the periphery of the watch case or into or through the hollow pendant or stem thereof, serves as the actuating device of the winding mechanism. The push pin is preferably divided into an outer push pin 30 adapted to slide longitudinally within the hollow pendant and an inner push pin or slide rod 35 actuated by the push pin 30 and having its outer end within said pendant and its inner end within the interior of the watch. The push pin 30 is screwed or otherwise attached at its outer end to the sliding crown or push button 25. Any suitable stop means are provided for limiting the strokes or movements of the push pin. Means shown for this purpose include a longitudinal slot 31, which may be in the form of a circumferential recess in the body of the pin 30, and the stop 16 which engages said slot or recess.

The slide or push rod 35 is guided in an eye 11 in the bridge between the back plate and the front or top plate *h* of the movement and at its inner end in a perforated lug 12 dependent from said plate *h*. This slide rod or stem 35 is normally held in outward position by any suitable spring tension and is preferably provided with an elongated head 36 at its outer end. This slide rod is provided with a stop 37 about midway of its length, which stop is shown in the form of a shoulder, the diameter of the inner portion of the rod being reduced from this point.

Any transmitting mechanism adapted for use in a watch may be employed for transmitting the inward thrust motion of the push pin or pins to the winding wheel or its

equivalent on the barrel arbor. The particular means herein shown which I have devised for this purpose and which are the best means devised by me include a driving pawl and ratchet mechanism disposed between the push pin and the winding gear of the barrel arbor. An arm or cross bar 40 which constitutes an actuator for the pawl and ratchet mechanism is provided on its under side with a perforated lug 41 through which the inner reduced portion of the slide rod 35 is passed, the stop on said rod engaging or being engaged by said perforated lug. This arm or cross bar 40 moves in and out with the movements of the push pin and slides over the face of the top plate of the works, said top plate having a recess 13 to permit the connecting lug 41 to pass. A link 45 is pivotally connected at its outer end to the arm 40 and pivotally connected at its inner end in any suitable manner to a movable pawl support. This link is preferably disposed in the same plane with the pawl support so as to secure compactness, and the connection of the link with the plate constituting the pawl support is of a peculiar construction which admits this relative arrangement of these parts. The movable pawl support 50 herein shown is in the form of an oscillating plate or collar loose on a fixed boss 55. The boss 55 is fixed on the top plate *h* of the works not far from the barrel arbor, being preferably provided with a central stud 56 which fits an opening in said top plate. The boss is preferably further secured in position on said plate by means of screws 57 and 58. The upper edge of the boss is provided with an overhanging lip or flange 59.

40 An intermediate gear wheel 60 is adapted to turn on the fixed boss 55 adjacent to said top plate and this gear meshes with the winding wheel *e* of the watch movement. The oscillating pawl support or collar 50 is disposed on the boss 55 above the intermediate gear wheel 60. This collar has preferably a rabbet 51 around its central opening to receive the flange 59 of said boss, whereby the collar is held in position.

50 The collar 50 is also provided with peripheral projections 52 and 53, the projection 52 having a circular slot 54 open at one side, and this slot has an overhanging lip or flange 54' similar to the lip 59 of the boss 55. The link 45 has a rounded enlargement or trunnion 46 at its inner end which fits the circular slot 54 of the collar 50 whereby the pivotal connection between said link and collar is made flush with the latter. The link has a recess 47 on one side to avoid interference with the periphery of the collar in the inward position of the link. This link is also provided on its opposite side with a recess 48 forming a stop shoulder 49

65 against which impinges the pointed side 52'

of the projection 52 and limits the return sweep of the collar 50. A pawl 65 is pivoted on the underside of the projection 53 of the collar 50, and a spring 66 secured at one end to the projection 52 of said collar bears at its free end on said pawl and tends to hold it in engagement with the teeth of said intermediate wheel 60 which serves the double purpose of a ratchet and a gear wheel. A spring 70 secured at one end by a set screw 71 in the top plate *h* of the works bears at its free end against the cross bar or arm 40 and operates to restore the winding mechanism to normal operative position after each actuation thereof. Any suitable spring or restoring device or mechanism may be employed.

In the operation of this stem winding mechanism, the watch may be held in one hand and a pressure by one finger or the thumb of the same hand upon the crown or push button 25 pushes the push pins 30 and 35 inward the distance of one stroke or until the push pin 30 is arrested by the stop 16. This inward stroke of the push pins carries the arm 40 inward between the dial and the top plate of the works toward the center of the watch, thrusts the link 45 inward and turns the collar 50 a partial rotation on its axis. The pawl 65 disposed on the pawl support 50 and engaging the immediate ratchet gear wheel 60 turns the latter the distance of five or six teeth more or less. The wheel 60 being in gear with the main winding wheel *e* of the barrel arbor turns said winding wheel whereby the barrel arbor is actuated and the main spring correspondingly wound. When the instroke of the push pins is completed, the crown 25 is released by the finger or thumb and the outstroke of said pins is effected by the spring 70, which restores the winding mechanism to normal position. The pawl 65 rides freely over the teeth of the wheel 65, which remains stationary, being interlocked by its intermeshing with the main winding wheel *e* held by its check pawl *f*. The crown 25 is operated in the manner of a push button a sufficient number of times to complete the winding up of the watch. The sliding push pins are more sensitive to the resistance of the spring being wound than the rotary winding stems ordinarily employed in stem winding watches, and such resistance is sufficient when the winding is nearly completed to serve as a positive warning to the operator. This warning avoids the danger of breakage of the main spring by excessive strain after the winding is completed or nearly so.

The mechanism and its details may be varied without departing from the scope of this invention.

I claim as my invention—

1. The combination of a time mechanism, 130

a watch case inclosing said time mechanism, a push pin adapted to slide radially in said watch case and project beyond the periphery thereof, an intermediate toothed wheel in operative connection with the winding arbor of said time mechanism, an oscillating pawl support, a spring pawl pivoted to said support and engaging said toothed wheel, and a link having pivotal connection with said pawl support and with said push pin.

2. The combination of a watch case, a tubular pendant thereon, a time mechanism, a winding mechanism, a push pin normally in connection with said winding mechanism, a hollow crown freely slidable in and out on said pendant and operative by inward thrusts in connection with said push pin to actuate said winding mechanism, and automatic means for thrusting said crown into normal winding position.

3. The combination of a watch case, a hollow pendant thereon, a spring actuated time mechanism, a freely slidable spring tensioned push rod terminating at its outer end in said pendant, means for transmitting the inward thrust motion of said push rod to the winding arbor of the time mechanism, and a hollow crown freely slidable longitudinally on said pendant, said crown being provided with a push pin and operative on its inward thrusts to wind the watch.

4. The combination of a spring-actuated time mechanism, a sliding spring-actuated push pin, a slide engaged by said push pin, a pawl and ratchet mechanism engaging the winding arbor of said time mechanism, and a link connecting said pawl and ratchet mechanism with said slide.

5. The combination of a watch case provided with a hollow pendant, a watch works within said case, whereof the front plate is provided with a radial recess in line with said pendant, a slide adapted to move over said front plate and provided with a lug extending into said recess, a push pin extending into said hollow pendant and engaging said lug, and a connecting mechanism between said slide and the winding arbor of said watch works.

6. The combination of a watch works having an eye in the bridge between the back and front plates and a perforated lug connected with one of said plates, a spring-tensioned push rod or stem supported in said eye and lug and a transmitting mechanism between said push rod and the winding arbor of said watch works.

7. The combination of a watch works hav-

ing an eye in the bridge between the back and front plates and a perforated lug connected with one of said plates, a spring-tensioned push rod supported in said eye and lug, a stop on said push rod, and a transmitting mechanism between said push rod and the winding arbor of said watch works.

8. The combination of a watch works, a pawl and ratchet winding mechanism therefor comprising an oscillating plate carrying the pawl for engaging the ratchet and provided with a peripheral circular slot open at one side, a reciprocating actuator, and a link pivoted at one end to said actuator and provided at its other end with a rounded trunnion engaging said circular slot.

9. The combination of a watch works, a pawl and ratchet winding mechanism therefor comprising an oscillating plate carrying the pawl for engaging the ratchet and provided with a peripheral circular slot open at one side, a reciprocating actuator, and a link pivoted at one end to said actuator and provided at its other end with a rounded trunnion engaging said circular slot, said link being in the same plane with said plate.

10. The combination of a watch works, a pawl and ratchet winding mechanism therefor comprising an oscillating plate carrying the pawl for engaging the ratchet wheel and provided with a peripheral circular slot open at one side, a reciprocating actuator, and a link pivoted at one end to said actuator and at the other end to said plate in the same plane therewith, being there provided with a rounded trunnion engaging said circular slot, said link having a recess on one side adjacent to said trunnion to avoid contact with the periphery of said plate when thrust inward.

11. The combination of a watch works, a pawl and ratchet winding mechanism therefor comprising an oscillating plate carrying the pawl for engaging the ratchet wheel and provided with a peripheral circular slot having an opening at one side and a point at one edge of said opening, a reciprocating actuator, and a link pivoted at one end to said actuator and at the other end to said plate in the same plane therewith, being there provided with a rounded trunnion engaging said circular slot and with a stop shoulder adapted to engage said point.

ABRAHAM PLEAN.

Witnesses:

JOSEPH FEINSON,
MAY PLEAN.