

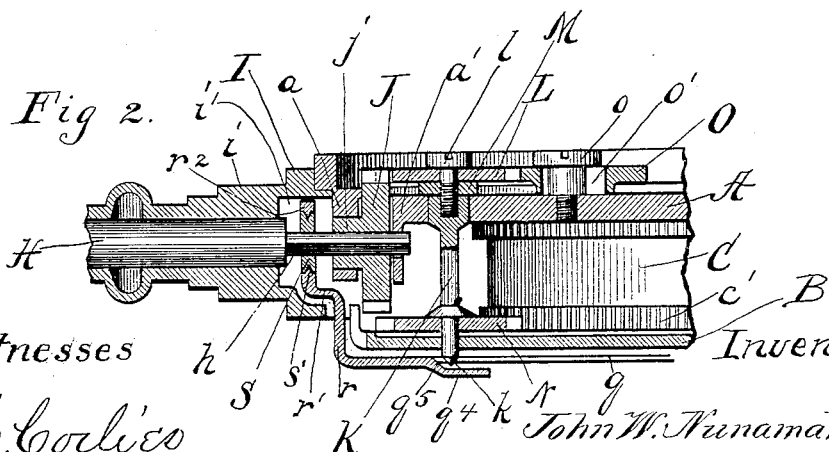
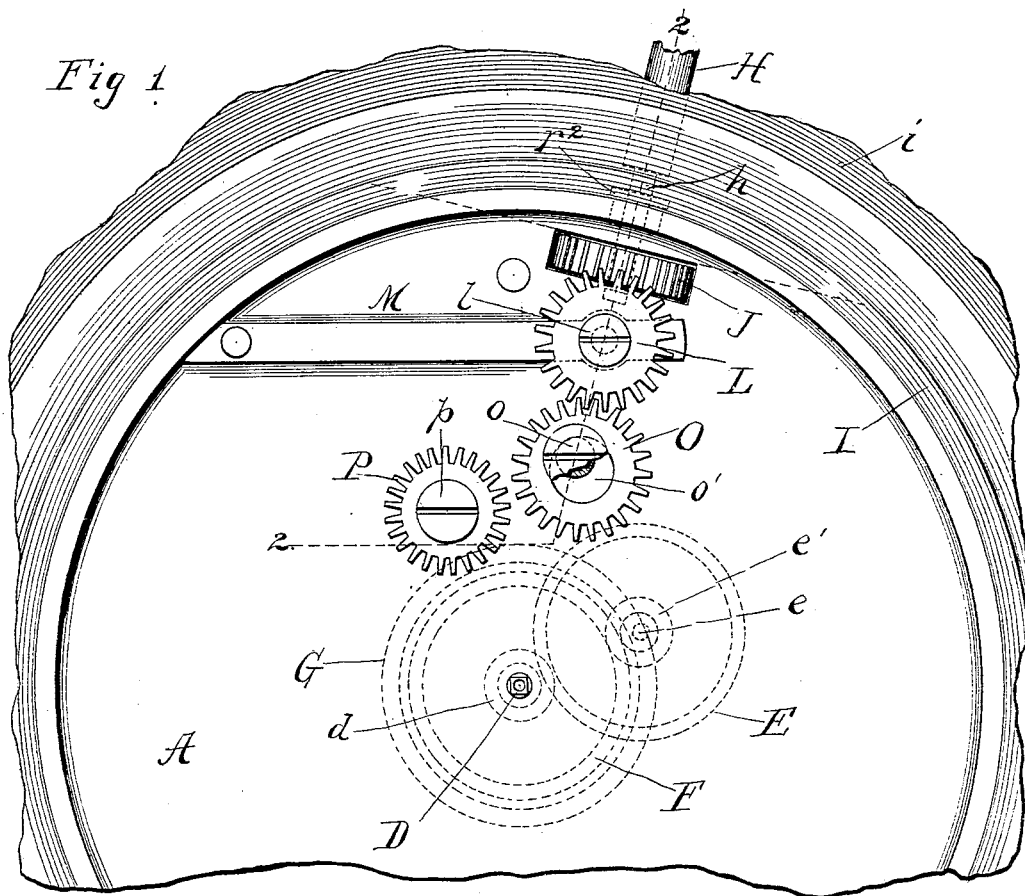
J. W. NUNAMAKER.

STEM WINDING AND SETTING MECHANISM FOR WATCHES.

No. 493,642.

Patented Mar. 21, 1893.

Fig 1



Witnesses

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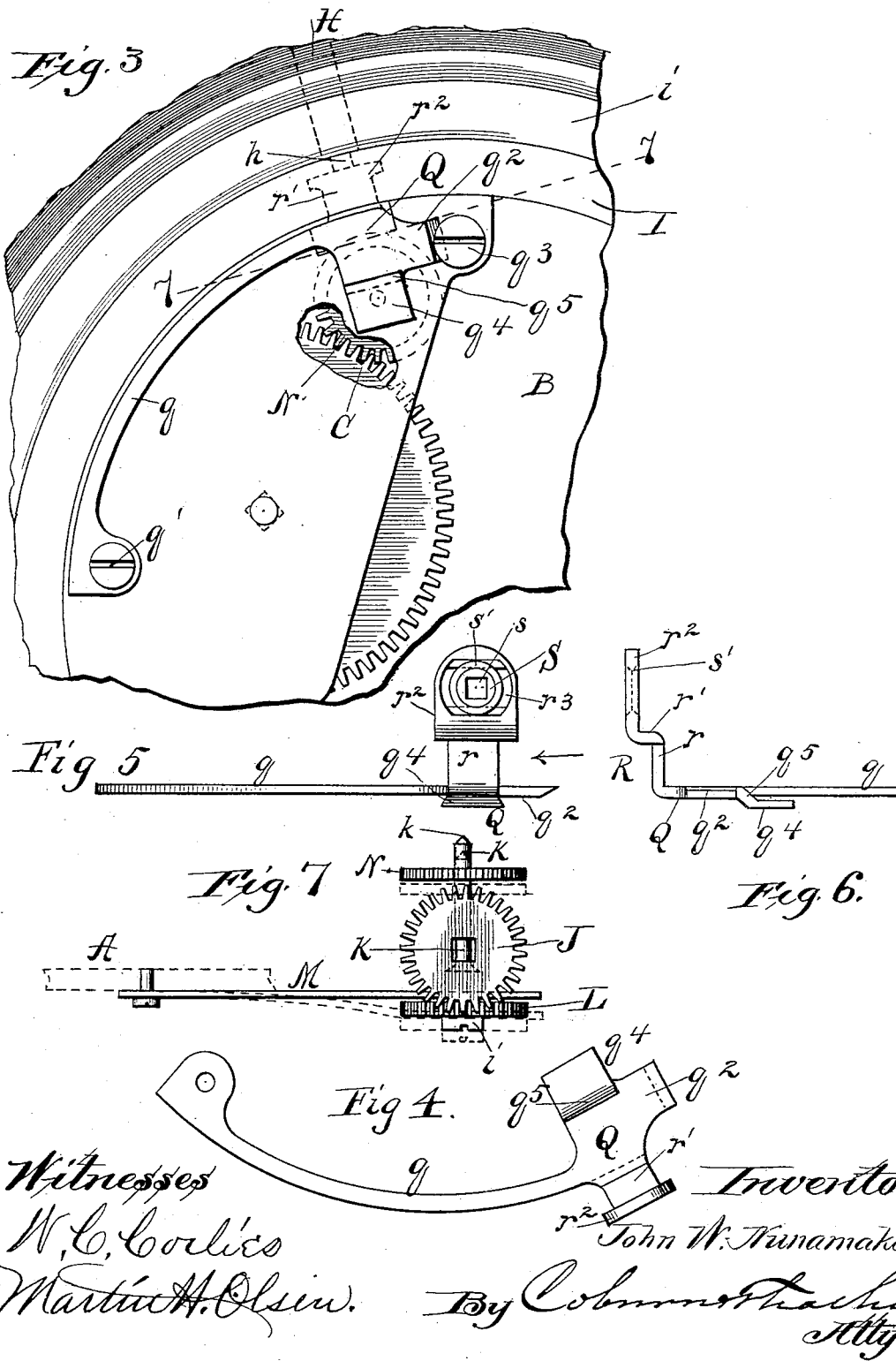
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STEM WINDING AND SETTING MECHANISM FOR WATCHES.

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UNITED STATES PATENT OFFICE.

JOHN W. NUNAMAKER, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-FOURTH
TO HARVEY L. HOPKINS, OF SAME PLACE.

STEM WINDING AND SETTING MECHANISM FOR WATCHES.

SPECIFICATION forming part of Letters Patent No. 493,642, dated March 21, 1893.

Application filed February 9, 1892. Serial No. 420,911. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. NUNAMAKER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hand-Setting Mechanism for Watches, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1, represents a plan view of a portion of a watch movement, with my invention applied thereto, the case being broken away; Fig. 2, a detail section taken on the line 2—2 of Fig. 1; Fig. 3, a detail reverse plan view of a portion of Fig. 1; Fig. 4, a plan view of the spring detached which adjusts the setting mechanism; Fig. 5, a front or outside elevation of the same; Fig. 6, an end elevation of the same looking in the direction of the arrow Fig. 5; and Fig. 7, a detail section taken on line 7—7 of Fig. 3.

My invention relates to mechanism for setting the hands of a watch by means of the pendant arbor, this feature of construction being generally used in that class of watches known as stem winders, though the hand setting mechanism is not necessarily connected with the winding mechanism, but may be employed for its purpose in watches where the winding is done with a key.

In hand setting mechanism heretofore used, the device for adjusting the setting devices has been arranged within the movement plates, so far as known to me, this adjusting device being operated by the sliding movement of the pendant arbor.

It is the object of my present invention to provide an adjusting device outside of the movement, so that it will be operated by the pendant arbor outside of the movement, but by the sliding of the former as heretofore.

I will now describe in detail the construction and operation of a hand-setting and winding mechanism in which I have embodied my invention in one practical way, and the particular improvements which I believe to be new and wish to secure by Letters Patent will then be more distinctly defined in the claims.

As the main features of the watch may be of any usual construction and my invention relates only to the hand-setting and winding

mechanism, I have shown in the drawings and shall describe only such parts of the watch as are necessary to an understanding of the construction and operation of my improvements.

In the drawings A, represents the front plate, and B, the back plate of a watch movement. The drum or barrel C, of the main spring is of usual construction. The driving gear *c'* of the drum engages as usual with a pinion on the main arbor D, and above the front plate is a pinion *d* sleeved on the upper end of the arbor and fixed thereto. This pinion engages with a gear E, mounted on an arbor *e* on which is fixed a pinion *e'*, which in turn engages with the hour hand wheel F, which is loosely sleeved on the hub sleeve of the pinion *d*. Just above the hour hand wheel is a large gear G, which is sleeved on the hub of the former, the friction between the two being sufficient to cause these two wheels to move together under ordinary circumstances; this latter gear wheel G, operates in connection with an alarm mechanism as set forth in my prior application, Serial No. 419,282; but as the alarm mechanism is not a part of my present invention, it is not here shown or described.

The pendant arbor H, is mounted so as to slide back and forth as usual in stem winding watches. This arrangement is shown in Fig. 2, in which I, represents an ordinary ring center provided with the usual pendant *i*, in which the arbor is journaled. The stem *h* of the pendant arbor passes in underneath the front plate and the arbor and stem have a sliding movement back and forth, the latter being square or angular in form. A gear pinion J, is mounted on the inner end of the arbor stem, which passes through the pinion and is free to move back and forth therein but turns the pinion with it whenever rotated, because of its angular shape. This pinion is journaled by means of a sleeve hub, which is mounted in a suitable bearing in a depending arm *a* of the front plate, as seen in Fig. 2, and inside of the pinion is a similar depending arm *a'* which serves to hold the wheel in place, and which is provided with an aperture to permit the arbor stem to move back and forth and at the same time rotate therein.

Just inside the pendant arbor stem and in line therewith is a vertical arbor K, journaled so as to have a certain amount of vertical sliding movement; the lower end of this arbor extends through and a little beyond the back plate, and terminating in a conical extremity k , as seen in Fig. 2. A pinion L, is secured to the upper end of this arbor K, by means of a screw pin l ; b it between the pinion and the arbor is arranged the inner and free end of a flat spring M, the pin l passing down through this spring and the other end of the latter being fastened to the front plate near its outer edge as seen in Fig. 1. A pinion N, is also fixed on the arbor K, near its lower end just within the back plate, and engages with the winding gear c' . A pinion O, is mounted on the front plate by means of a journal pin o set in the latter about in line with the pendant and just within the pinion L; the bearing aperture of this pinion is cut out so as to form a central opening o' considerably larger than the journal pin, thus providing for lateral movement of the pinion on its journal. A gear pinion P, is also mounted on the upper side of the front plate by a journal pin p set therein and is arranged to engage with the alarm wheel G. The idler O, is between the pinions P and L, but its journal is not in line with the journals of the latter, but is a little inside thereof, as seen in Fig. 1. The spring M, acts to hold the arbor K, normally in its lower or back position, as seen in Fig. 2. In this position the winding pinion N, is below the plane of engagement with the driving pinion on the pendant arbor stem, as shown in said figure, and in this adjustment the rotation of the pendant arbor will rotate the upper pinion L, only. This pinion L, is in engagement with the idler O, and as the latter has a lateral movement on its journal the turning of the pendant arbor in one or the other direction, thereby rotating the pinion L, in one or the other direction, will first move the pinion O, into engagement with either the gear wheel E, or the pinion P, and then rotate the one or the other, by means of which the hands will be set as will be readily seen.

It is obvious that for winding the watch it will be necessary to adjust the mechanism so as to throw the setting gear out of engagement with the driving pinion on the pendant arbor stem, and bring the winding pinion N, into engagement therewith. This is effected by a peculiar device operated by the pendant arbor, when pushed inward, to slide the arbor K, vertically, thereby lifting the pinion L, out of engagement with the driving pinion J, and bringing the pinion N, into engagement therewith. This device is in its main part a plate Q, which is arranged to lie on the back plate just about parallel with the pendant arbor. It is provided with a long spring q curved to correspond with the edge of the back plate, extending along the same and fastened at its outer end thereto by a

screw q' ; on the opposite edge the plate is extended outward until its edge q^2 is brought underneath the head of a screw q^3 by which the plate is held to the back plate, but at the same time is permitted to move in and out. This plate extends inward to the lower end of the arbor K and then is dropped down slightly, so that its inner end q^4 is bent downward, the bend providing an inclined face q^5 as seen in Fig. 2. When in normal position, as seen in Fig. 2, this dropped portion of the plate is below the lower end of the arbor in its lower adjustment; it is obvious however, that if the plate is pushed in the incline or bend will be brought into contact with the conical end of the arbor and raise the latter causing the arbor to slide upward. This movement effects the desired change in the adjustment of the gear pinions, bringing the winding pinion N, into engagement with the driving pinion J and disengaging the pinion L, therefrom, the spring M, yielding to permit this movement. At the outer end of the plate Q, there is provided an arm R, which extends directly upward at right angles to the plate for a little distance, as seen in Figs. 5 and 6. This arm may be in one piece with the plate or separate therefrom as may be desired. It is outside of the back plate and projects into the ring center which is cut out for this purpose; then it is bent outward at right angles for a little way and then directly upward again, the upper end being somewhat enlarged and arranged within a suitable recess r' in the ring center at the junction of the pendant therewith, which is sufficiently large to permit some movement of this end of the arm out and in. It will be seen then that the arm R, is composed of three sections, a short, straight section r , extending at right angles to the sliding plate directly toward the pendant arbor, a second short section r' extending directly outward at right angles to the former and a third section r^2 arranged at right angles to the latter and so parallel with the first section r . Now it is obvious if a pressure is brought to bear upon the upper end of this arm R, it will be forced inward and thereby move the sliding plate inward to raise or slide the arbor K, in the direction of its length by the action of the bend or incline, in the plate, on the lower end of the arbor. This pressure on the arm is effected by the sliding movement of the pendant arbor, the stem of the latter being carried through the upper end of the arm, as seen in Fig. 2, so that when the arbor is pushed inward the shoulder at the beginning of the stem will strike the arm and force it inward. I have shown in the drawings a desirable way of mounting the pendant arbor stem in this arm, it is effected by means of a disk S, which is set in a suitable aperture r^3 in the arm; this disk has a central perforation s shaped like the arbor stem, so as to receive the latter and permit it to slide back and forth therein. Around the disk is a circumferentially V shaped groove

s' and the edge around the opening r^3 is V shaped to fit this groove, as seen in Fig. 2. The opening r^3 is elongated, as seen in Fig. 5, which permits some slight movement of the disk in its seat to prevent any opening of these parts. This however, is only a desirable device for mounting the arm on the stem of the arbor, and any other suitable means may be employed.

10 In normal adjustment, it will be noticed that, as already described, the devices are in position for setting the hands, simply by turning the pendant arbor in one direction or the other. When it is desired to wind the watch 15 the pendant arbor is pushed inward, thereby sliding the arbor K. in the direction of its length as described, thus disengaging the setting pinion L from the driving pinion on the arbor stem and bringing into engagement 20 therewith the winding pinion N, when of course, the watch may be wound without disturbing the hands. But it is not desirable in carrying a watch to have the hand-setting mechanism in constant engagement, but 25 rather the winding mechanism. It will be understood that the sliding pendant arbor is provided with the usual catch or stop to secure it in position when thrust inward. The adjustment of the parts for ordinary use 30 then will be to thrust the arbor inward until its stop is engaged, when the setting gear will be out of position and the winding gear in proper engagement, as seen in Fig. 7. With this arrangement the watch may be 35 wound at any time, but, in order to set the hands, the arbor must first be pulled out, when the springs will bring the parts into the adjustment seen in Fig. 2, for hand-setting.

It will be understood of course, that the setting of the hands by the use of the pinion P 40 cannot be done, while the alarm mechanism described in my prior application is set for operation, which of course would only be occasionally, so that practically this pinion is 45 available for setting the hands in one direction, because the alarm mechanism is thrown out of working adjustment the greater portion of the time.

It will be noticed that I have here provided 50 an adjusting device for the winding and setting mechanism that is entirely outside of the watch movement, being fastened on the outside of one of the plates of the latter, and lying wholly outside thereof and operated from the 55 outside thereof. This brings the device within easy reach and operation and also permits it to be readily removed without disturbing in any wise the ordinary works of the watch.

Having thus described my invention, what 60 I claim as new, and desire to secure by Letters Patent, is—

1. In a stem winding watch, an arbor mounted to slide in the direction of its length, in combination with a winding pinion and a setting pinion both mounted thereon, an adjusting device arranged on the outside of the 65 movement, adapted to move the said arbor

lengthwise in its bearings, and a sliding pendant arbor, arranged to actuate said adjusting device outside of the movement, substantially 70 as described.

2. In a stem winding watch, an arbor mounted to slide in the direction of its length in combination with the winding and setting pinions mounted thereon, an adjusting device 75 adapted to move said arbor lengthwise arranged outside of the watch movement, a sliding pendant arbor arranged to make contact with said device outside of the movement to operate it for adjustment, and driving 80 pinion on the stem of the pendant arbor, substantially as described.

3. A sliding pendant arbor H, in combination with the sliding arbor K, the hand setting pinion L, and winding pinion N, mounted 85 thereon, the driving pinion J, on the stem of the pendant arbor, the slide Q, provided with the incline or bevel q^5 and arranged on the outside of the back plate, and the arm R, on the slide Q, bent around the outside of the 90 movement and mounted at its outer end on the stem of the pendant arbor, substantially as described.

4. The arbor K, mounted to permit movement lengthwise, in combination with the 95 hand-setting and winding pinions L, N, mounted thereon, the spring M, the sliding plate Q, provided with bevel q^5 , the sliding pendant arbor H, the arm R, mounted on the said arbor and connected at its other end to 100 the sliding plate, and the driving pinion J, on the pendant arbor stem, substantially as described.

5. The sliding pendant arbor H, in combination with the sliding arbor K, winding and 105 setting pinions L, N, mounted thereon, the sliding plate Q, provided with bevel q^5 , spring q on which said plate is mounted, and arm R, bent as specified and connecting the sliding plate with the pendant arbor, substantially 110 as described.

6. The sliding arbor K, carrying the winding and setting pinions, in combination with the sliding plate Q, provided with bevel q^5 and projecting edge q^2 , the screw q^3 setting 115 over said edge, the spring q carrying said plate on one end and fastened at the other to the outside of the back plate, the sliding pendant arbor and a device connecting the same with said plate, whereby the latter is forced 120 inward by the pendant arbor against the action of the spring on which it is mounted, substantially as described.

7. A sliding pendant arbor, in combination with the arbor K, movable lengthwise, the 125 winding and setting pinions N, L, mounted thereon, the idler O, provided with an enlarged journal opening o' , the pinion P, the beveled sliding plate Q, arm R, driving pinion J, and the train gear driving the hands of 130 the watch, substantially as described.

8. The sliding arbor K, carrying the setting and winding pinions, in combination with the sliding plate Q, provided with bevel to move

said arbor, the arm R, connected to said plate and bent around the outside of the movement, the ring center I, cut out to form a chamber i' for the outer end of the arm R, and the
5 sliding pendant arbor H, provided with stem h passing through the said arm, substantially as described.

9. The arbor adjusting plate Q, in combination with the arm R, connected thereto and at
10 its outer end provided with an elongated

opening r^3 , the disk S, provided with V shaped groove in its edge and central opening s , and the sliding pendant arbor H, the stem h of which passes through the central opening in said disk, substantially as described.

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