

(No Model.)

J. W. NUNAMAKER.  
STEM WINDING AND SETTING WATCH.

No. 492,612.

Patented Feb. 28, 1893.

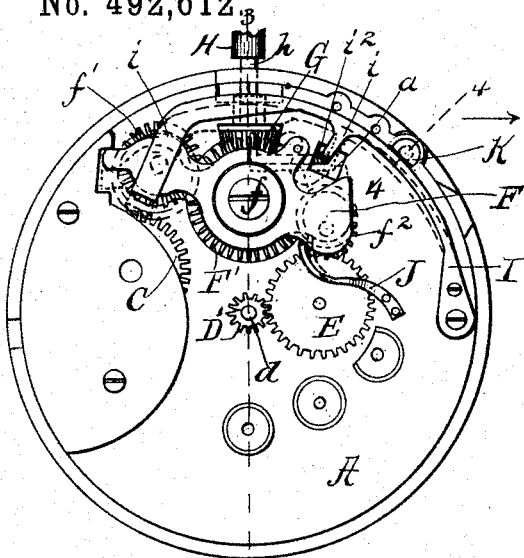


Fig. 1.

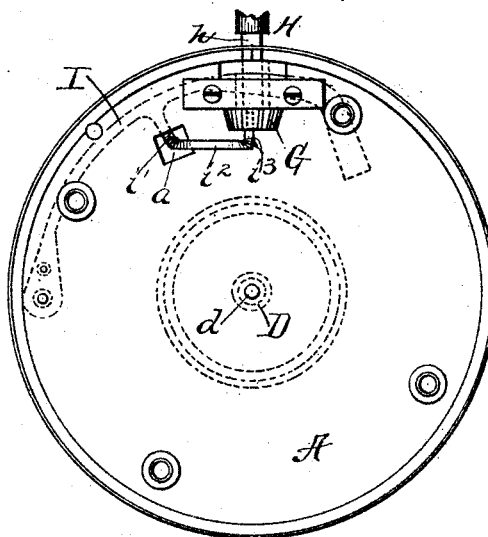


Fig. 2.

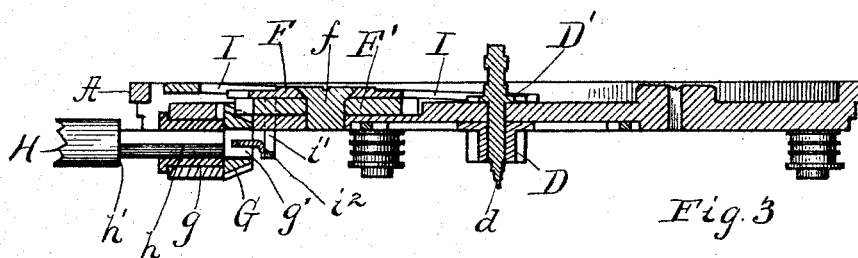


Fig. 3.

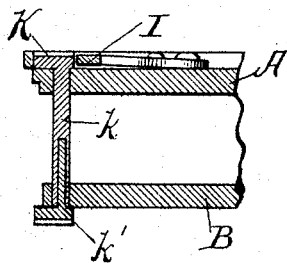


Fig. 4.

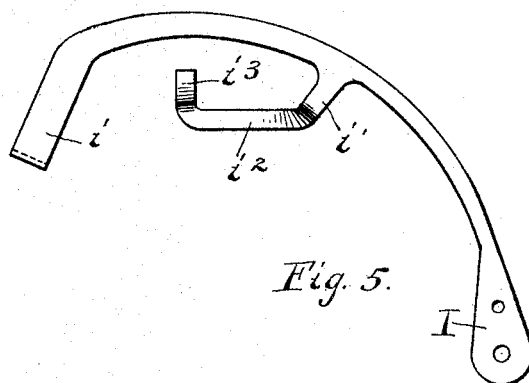


Fig. 5.

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# UNITED STATES PATENT OFFICE.

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TO HARVEY L. HOPKINS, OF SAME PLACE.

## STEM WINDING AND SETTING WATCH.

SPECIFICATION forming part of Letters Patent No. 492,612, dated February 28, 1893.

Application filed March 14, 1892. Serial No. 424,863. (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 and Winding 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 watch movement with my invention applied; Fig. 2, a reverse plan of the same; Fig. 3, a section of the same, taken on the line 3—3, of Fig. 1; Fig. 4, a detail section, taken on the line 4—4, of Fig. 1; and Fig. 5, a perspective view of the actuating spring, detached. Figs. 1 and 2 of the drawings are on one scale; and the remaining figures upon another and enlarged scale.

My invention relates to mechanism for setting the hands of watches, by means of the pendant in stem winding watches, in which class the pendant is also employed to wind the watch.

The invention consists in certain devices, whereby the hand setting mechanism is adjusted to operative position by the inward movement of a sliding pendant, and I will describe in detail the construction and operation of this mechanism as I have applied it to a watch in one practical way.

The improvements which I believe to be new and wish to secure by Letters Patent will be defined more particularly in claims.

In the drawings, A represents the front plate of a watch movement, and, B, the back plate.

It is not necessary for an understanding of my invention to show and describe the entire mechanism for winding and the entire mechanism for the regular movement of the hands; the main parts of these devices may be of any known construction and organization. Therefore, I have shown and will describe only the members of these mechanisms which may be called initial to the adjustable devices, whereby the winding of the watch or setting of the hands may be accomplished by the stem.

The gear-wheel, C, mounted above the front

plate, is connected up with the drum, so that the main spring is wound by the rotation of this wheel.

The pinion, D, is on the arbor, *d*, which carries the hands and so the rotation of this pinion revolves the hands, as required. This main pinion D is shown below the front plate in Fig. 3 of the drawings and on the same arbor above the front plate is a second pinion, D'.

In the train of gearing here shown, a transmitting gear, E, is mounted on the front plate and arranged in constant engagement with the pinion D', but this is a mere arbitrary feature. The adjustable device, whereby gearing operated by the stem of the watch, is thrown into engagement with either the wheel C, or the wheel E as here shown is of an ordinary type in its main features. It consists of a plate of irregular shape, generally known as the "yoke" and is designated by F in the drawings. This yoke is mounted above the front plate and is pivoted thereto by a pivot-screw, *f*, and on this pivot, underneath the yoke, is journaled a gear-wheel, F', while at the respective ends of the yoke are mounted pinions *f'*, *f*<sup>2</sup>, which are both in engagement with the wheel F' and these parts are arranged, as usual, so that by the vibration of the yoke upon its pivot, the pinion *f'* may be brought into engagement with the winding gear or the pinion *f*<sup>2</sup> into engagement with the hand setting gear.

Below the front plate is mounted the usual pinion, G, with a horizontal journal and arranged to engage with the wheel F'. The pinion is journaled by means of a hub, *g*, and a central perforation, *g'*, extends through both and is shaped to conform to the angular section, *h*, at the inner end of the stem, H, so that the latter may slide back and forth in this aperture and also rotate the pinion whenever the stem is turned in either direction. This stem is mounted in any of the ordinary ways in the pendant of the case, in which it has both rotatory and longitudinal movement; and the pendant is to be supplied with any known device for catching and holding the stem from sliding. The rotation of the stem will, as usual, rotate the wheel F' and through it the winding gear or the hand setting gear

according as the yoke is adjusted to bring its gearing into engagement with one or the other of these trains. The device for effecting this adjustment of the yoke is a lever spring, I, of peculiar construction. It is composed of a long flat spring, curved to conform substantially to the circle of the front plate and fastened at one end to the top of the latter near the outer edge thereof and about a quarter of the way round from the stem. This spring extends around near the outer edge of the plate over and beyond the journal of the pinion G and then is bent inward at its extremity to provide a straight arm, *i*, which is extended over the outer end of the yoke, which it is constructed to embrace and to which it is fastened. The construction and relative arrangement of these parts are such that the normal action of the spring is to swing the outer end of the yoke toward the edge of the plate and so hold the pinion *f'* out of engagement with the gear-wheel C, as seen in Fig. 1. About midway of the length of the spring, there is an arm, *i'*, which first extends inward over the front plate and is then bent downward through an opening, *a*, in said plate and then bent up in a horizontal position and carried straight out by a section, *i''*, to a point in front of the pinion G, when it is again bent about at right angles outward to form a short toe, *i'''*, projecting straight outward into the central opening in the said pinion G, as seen in Fig. 3. For convenience in making these bends, the section *i''* is a little lower than the center of the pinion opening, so that a twist bend, as seen in Fig. 3, will bring the toe into a higher plane and about centrally of the pinion opening. When the stem is thrust inward the inner end thereof will come in contact with this toe on the end of the arm *i* and the pressure of the stem thereon will force it inward, thereby bending the spring, I, inward, which movement will, of course, swing the yoke in a direction to engage the pinion *f'* with the winding gear C and at the same time disengage the pinion *f''* from the second gear. The adjustment of the yoke for winding or hand setting is, therefore, effected by the longitudinal movement of the stem, through direct action on this lever spring, which, in turn acts directly upon the yoke. The normal adjustment for the devices is with the spring forced inward and the yoke swung to bring the gear train into engagement with the winding gear. As described above this adjustment is effected by thrusting the stem inward and the stop catch for the latter is arranged to engage in this position and so hold the gear train in engagement with the winding devices. Whenever it is desired to set the hands the stem is simply pulled out from engagement with its spring catch, when, of course, the lever spring is relieved from compression and will at once move outward, thereby swinging the yoke to disengage the winding gearing and bring the hand setting gearing into engagement, as seen in Fig. 1, when, of course, the hands may

be set, as desired, by turning the stem in the usual way.

The position of the yoke and adjusting devices first described is shown in dotted lines in Fig. 1, this being the adjustment for ordinary use and the latter adjustment being only occasional when it is desired to set the hands. The spring I need not necessarily be connected to the yoke, so as to move it positively, except to swing it outward, or the connection may be such as to vibrate the yoke in both directions positively by the spring; in the former case a spring, J, is fastened at one end to the front plate and extended inward with its free end resting upon the inner end of the yoke, the parts being arranged so that this spring will operate to vibrate the yoke in a direction to disengage the setting gear and bring into engagement the winding gear when the yoke is released from the outward tension of the spring I.

When the movement is taken from the case it is obvious that there will be nothing to hold the spring I inward and so the normal adjustment, under these circumstances, would be to engage the hand setting; but this is not the adjustment of the devices desired under the circumstances named. I, therefore, provide a device by means of which the spring I may be depressed or forced inward when the movement is taken out of the case. This consists of a small cam, K, on the end of a shaft, *k*, mounted in the movement plates, as seen in Fig. 4. The cam is on the end of the shaft projecting through the front plate and arranged so that it will lie directly against the outer edge of the spring I, as seen in Fig. 1. At the other end a half screw or half headed screw, *k'*, is turned into the end of the shaft and set up against the back plates, as seen in Fig. 4, thus making this device one of the means for securing the plates together. Now by turning the half screw in the proper direction the shaft with its cam will also be turned, so as to bring the cam into action against the spring I, and thereby force the latter inward and adjusting the yoke to disengage the hand setting gear and engage the winding gear, in which adjustment it will be held when the movement is out of the case.

In the construction described above and shown in the drawings, the arm on the spring I, by means of which it is moved by the stem, is arranged so that it stands inside the plates and is operated by the end of the stem. It is obvious, however, that with only a slight modification it may be arranged so as to stand outside of the movement plates and be operated by the shoulder on the stem. In this modification the arm *i* is extended outward from the outer edge of the spring I and then bent down outside of the movement plates and brought into position where the shoulder *h'* of the stem H will be brought into contact therewith, when the stem is thrust inward. Obviously the shoulder on the stem will, in this movement, push the arm *i* inward and

thereby force the spring I inward in just the same way as described above with the arm on the inside of the spring and within the plates.

There are other modifications of the devices herein described and shown, especially of the actuating spring, which may be made without departing from the characteristic features of my invention.

The purpose of my improvement is to provide a single spring constructed and arranged to be acted upon directly by the sliding stem and connected directly or substantially so with the yoke, so that the stem acts positively upon the spring and the latter in turn positively actuates the adjustable yoke. With this understanding of my invention it is obvious that the form and relative arrangement of the actuating spring itself may be modified in a variety of ways and I do not wish to be understood as limiting my improvement to the particular construction and arrangement of devices here shown and described.

As stated in the description above the connection between the spring I and the yoke here shown, is such that the spring will positively swing the yoke outward only. This is because an outward movement of the outer end of the yoke must be possible even when the pinion  $f'$  is in engagement with the winding gear to provide for the reverse or backward movement of the stem, so commonly made in winding a watch. The spring J while holding the yoke up to this engagement, permits the yielding movement suggested above. The relation of the parts may be changed, however, and in fact the spring may

be connected to positively move the yoke in both directions, in which case the spring should be constructed to yield itself sufficiently to permit the vibration referred to. 40

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

1. In a winding and hand setting mechanism for watches, a vibrating yoke F, in combination with the pinions  $f'$ ,  $f''$ , mounted on its respective ends, the gear  $F'$ , the tubular pinion G, the sliding stem H, the inner end of which moves in said tubular gear, and the spring I fixed at one end and connected at its free end to the outer end of the yoke and provided with an arm  $i$  bent inward and downward through the front plate and having at its extremity a toe  $i^3$  projecting into the central opening of the pinion  $h$  just in front of the inner end of the stem, substantially as described. 50 55

2. In a winding and hand setting mechanism for watches, the vibrating yoke F, in combination with the pinions  $f'$ ,  $f''$  mounted at its opposite ends, the springs I fixed at one end to the front plate and connected at the other to the yoke, and a cam K arranged just outside of the spring and adapted to be turned to force the latter inward and retain it in such position when the movement is detached, substantially as described. 60 65

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Witnesses:

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