



# UNITED STATES PATENT OFFICE.

GEORGE S. KLEIN, OF TORONTO, CANADA.

## STEM-WINDING WATCH.

SPECIFICATION forming part of Letters Patent No. 521,884, dated June 26, 1894.

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*To all whom it may concern:*

Be it known that I, GEORGE S. KLEIN, watch-maker, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Stem-Winding Watches, of which the following is a specification.

My invention relates to watches in which the winding and hand setting train is shifted from the winding to the setting position and vice versa by the longitudinal movement of an arbor contained within the pendant and by the rotation of which the winding and setting movements are effected and the object of the invention is—first—to provide a simple, effective and positive connection between the stem arbor and the train of gear for changing the position of the yoke for winding or setting and—secondly—of providing a positive means for holding the yoke in either position to which it may be changed no matter whether the movement is in the case or removed from it and it consists essentially—first—of forming the stem arbor in two parts, the portion which extends through the pendant being connected to the portion which extends through the bevel pinion by a hollow split threaded plug, which is screwed into a female threaded collar forming part of the portion of the spindle extending through the bevel pinion as hereinafter described, an annular ring being made in said collar and means being provided whereby when the stem arbor is moved into its outer position the setting train of wheels is thrown in and when the arbor is moved into its inner position the winding train of wheels is thrown into gear and—secondly—of connecting the annular ring on the collar within which is secured the stem arbor to a notch in the yoke by a bell crank lever, the jaws of one arm of which extend on each side of the annular ring on the collar and the end of the other arm being designed to co-act with the notch, a supplemental tail being provided which is notched and is designed to co-act with a spring crank, the long arm of which fits into a notch in the yoke and the short arm of which is designed to co-act with the notch in the end of the supplemental tail as hereinafter more particularly explained.

Figure 1, is an enlarged face view of portion of the center and movement plate of the

watch showing the parts involved in my invention as they will appear when the yoke is shifted to the winding position. Fig. 2, is a similar view showing the parts as they will appear when shifted to the setting position. Fig. 3, is a much enlarged section through the line  $x-y$  Fig. 1. Fig. 4, is an enlarged detail of the split threaded plug.

In the drawings like letters of reference indicate corresponding parts in each figure.

A, represents the watch center, B, the pendant and C, the stem arbor, which has a rotary and longitudinal movement within the pendant in which it may be held in two positions within such pendant namely the winding and setting positions in the manner now commonly known. I do not show the means of holding the stem arbor in such position as it is not essential in explaining the features of my invention.

D, is the movement plate which is secured within the center, B, in the usual way.

C', is a collar, which is provided with an annular projection,  $c$ , which is located about midway between its ends.

$c'$ , is a square stem which forms part of the collar, C', and a continuation of the stem arbor, C, when the collar is connected to it in the manner I shall now describe.

The collar, C', has a cylindrical hole,  $c^2$ , made in it from the outside which is threaded as shown and is tapered at the top.

E, is a hollow, threaded plug, which has cut longitudinally in it a series of splits,  $e$ . The inside hole,  $e'$ , of the plug is mainly cylindrical except at the top,  $e^2$ , which is square and of less diameter than the cylindrical hole, but of slightly greater diameter than that of the stem arbor, that is to say when such plug is removed from within the threaded hole,  $c^2$ , or only partially screwed within said hole. When the plug, E, is screwed home as indicated in Fig. 3, the square size of the top of the plug securely grasps the stem arbor and prevents it from moving longitudinally within the plug or in other words makes the stem arbor, C, collar, C', and square stem,  $c'$ , as one piece.

The collar, C', is journaled in the bearing box, F, in which it is capable of longitudinal adjustment by the manipulation of the crown, G, of the pendant.

In order to connect the stem arbor, C, to the collar C', it is necessary before inserting the movement into the case to partially screw the plug, E, into the threaded hole  $c^2$ , in the collar, C'. The collar, C', is brought around so as to have a hole,  $c^3$ , opposite to the hole,  $f$ , in the bearing F. A pin is inserted through both of these holes so as to hold the collar, C', from turning. The stem arbor, C, may now be inserted in the square hole,  $e^2$ , at the top of the plug, which is of course large enough to admit it when the plug is only partially screwed into the collar. By now turning the crown, G, to the right the plug is screwed home into the collar, C', and the edges of the hole,  $e^2$  being compressed inwardly grip the sides of the stem arbor so as to make it perfectly solid with the collar. In removing the movement from the center it is also of course necessary to insert the pin through the holes  $f$ , and,  $c^3$ , so as to hold the collar, C', solid, and turn the crown, G, of the pendant in the opposite direction, so that the plug, E, may be lowered sufficiently, so as to release the stem arbor, C.

Upon the square stem,  $c'$ , is placed the bevel pinion, H, used for winding and setting. The bevel pinion, H, as will be seen on reference to Fig. 3, is situated beneath the movement plate, D, and meshes with a crown gear,  $i$ , formed on the gear wheel, I. The gear wheel I, has bearings on the movement plate and is secured in position within the yoke, J, by the plate, K, and left hand screw,  $k$ , as indicated in Figs. 1, 2, and 3. The gear wheel, I, meshes with the gear wheel, L, pivoted at one end of the yoke, such gear wheel, L, being indicated by full lines in Fig. 1, and dotted lines in Fig. 2, and the gear wheel, I, also meshes with the gear wheel, M, pivoted in the opposite end of the yoke.

N, is the winding wheel, which is partially shown in full lines and partially in dotted lines in Figs. 1 and 2.

O, is the minute hand setting gear, which meshes with the dial wheel, P, by which the minute hand is set.

$p$ , is a pinion secured on the gear wheel, O, and designed to mesh with the hour hand dial wheel, Q, as indicated in dotted lines.

R, is a bell-crank lever pivoted at,  $r$ , and having jaws  $r'$ , which extend to each side of the annular projection,  $c$ , of the collar, C'.

$j$ , is a notch made in the yoke. This notch is designed to be engaged by the arm,  $r^2$  of the bell-crank lever R, as indicated in Fig. 2, when it is designed to throw and hold the hands setting train in mesh.

$r^3$ , is tail forming part of the bell-crank lever and, S, is a spring crank pivoted at,  $s$ . One end of the crank is V-shaped and engages with a corresponding notch,  $r^4$ , made in the end of the tail,  $r^3$ . The long spring end of the crank lever, S, engages with the notch,  $j'$ , made in the yoke, J.

When it is desired to throw the winding train into gear the crown, G, is pushed in-

wardly so as to remove the arm,  $r^2$ , of the bell-crank lever, R, out of the notch,  $j$ , in the yoke, J, and bring the short end of the crank, S, into the notch,  $r^4$ , in the tail,  $r^3$ . In this the normal position of the setting and winding gear the winding train is shown to be complete through the stem arbor, bevel pinion, H, crown gear  $i$ , gear wheel, L, and winding wheel, N. When it is designed to change the position of the yoke, so as to throw into mesh the setting gear, the crown, G, is pulled outwardly, so as to pull the stem arbor, C, collar, C', and jaws,  $r'$ , outwardly, thereby tilting the bell-crank lever, R, on its pivot so as to force the arm,  $r^2$ , of such crank into the notch,  $j$ , of the yoke J, thereby changing the position of the yoke and throwing the gear wheel, M, into mesh with the gear wheel, O, of the dial train of gear. By pushing the crown, G, inwardly after having set the hands the yoke and train of gear are restored to the normal position shown in Fig. 1.

It will be noticed in the inward and outward pull of the stem arbor by the crown, G, that the square stem,  $c'$ , forming practically one solid part of the stem arbor will move longitudinally within the bevel pinion, without affecting its position upon the crown gear,  $i$ .

From this description it will be seen that I provide a very simple means by which the stem arbor may be rigidly connected to the stem of the pinion and also whereby the position of the yoke may be changed, so as to throw in the winding or setting mechanism as desired.

I am enabled by the construction adopted to fit or remove the movement from the case without disturbing the winding or setting mechanism. I am also enabled by my invention to readily connect the winding and setting mechanism of a certain sized movement to the stem arbor of any make of case of similar size.

In removing the movement from the case it is simply necessary as hereinbefore described to insert a pin into a hole in the collar, C'. It will also be seen that the proper working of the movement will not be affected when taken out of case nor will it be necessary to provide any supplemental means for holding the parts of the winding and setting mechanism in their proper relative position when the movement is out of the case.

What I claim as my invention is—

1. The combination with a stem arbor of indeterminate length in a case-pendant, of a collar, having a stem longitudinally adjustable within the bevel pinion by which the winding and setting train is set in motion, and connected to the stem arbor by a hollow threaded plug provided with a series of splits which plug is screwed home into the collar, and means whereby the collar is operatively connected to the yoke so as to change it to the setting or winding positions as shown and for the purpose specified.

2. The combination with the stem arbor, C, in a case-pendant, of a collar, C', having a square stem, c', extending through the bevel pinion, H, a threaded plug, E, made hollow and provided with splits, e, and a square upper hole, e<sup>2</sup>, to grip the stem arbor and tapered at the top so as to fit into a corresponding taper at the top, of the cylindrical hole c<sup>2</sup>, and an annular projection, c, made in the collar and means whereby the annular projection, c, is connected to the yoke, so that the position of such yoke is changed to throw in the winding or setting train as and for the purpose specified.

3. The combination with the stem arbor, C, collar, C', connected to the stem arbor by the threaded split plug, E, as specified, and having an annular ring, c, of the bevel pinion, H, meshing with the crown wheel, i, of the gear wheel I, the yoke, J, containing the gear wheels, L, and, M, and the pivoted bell crank lever, R, provided with jaws, r', which extend at each side of the annular projection, c, of the collar, C', the arm, r<sup>2</sup>, designed to be brought into engagement with the notch j, the

tail, r<sup>3</sup>, having a notch, r<sup>4</sup>, made in the end and the spring crank, s, one end of which fits into the notch, r<sup>4</sup>, and the other into the notch, j', in the yoke, J, as and for the purpose specified.

4. The collar, C', having a cylindrical hole, c<sup>2</sup>, threaded as specified, and the threaded plug, E, provided with splits, e, cylindrical opening, e', and the square top opening [e<sup>2</sup>, which plug, E, is screwed home into the cylindrical threaded hole, c<sup>2</sup>, of the collar as and for the purpose specified.

5. The combination with the stem arbor, of the collar C', split plug, E, designed to be inserted in a cylindrical socket in the collar and grip, by the square opening at the top of the plug, the stem arbor, and the bevel pinion H, situated on a square stem of the collar and designed to communicate motion to the winding or setting trains, whichever may be thrown in, as and for the purpose specified.

GEORGE S. KLEIN.

Witnesses:

B. BOYD,  
E. R. CASE.