

D. H. CHURCH.
STEM WINDING AND SETTING WATCH.

No. 520,633.

Patented May 29, 1894.

FIG. 1.

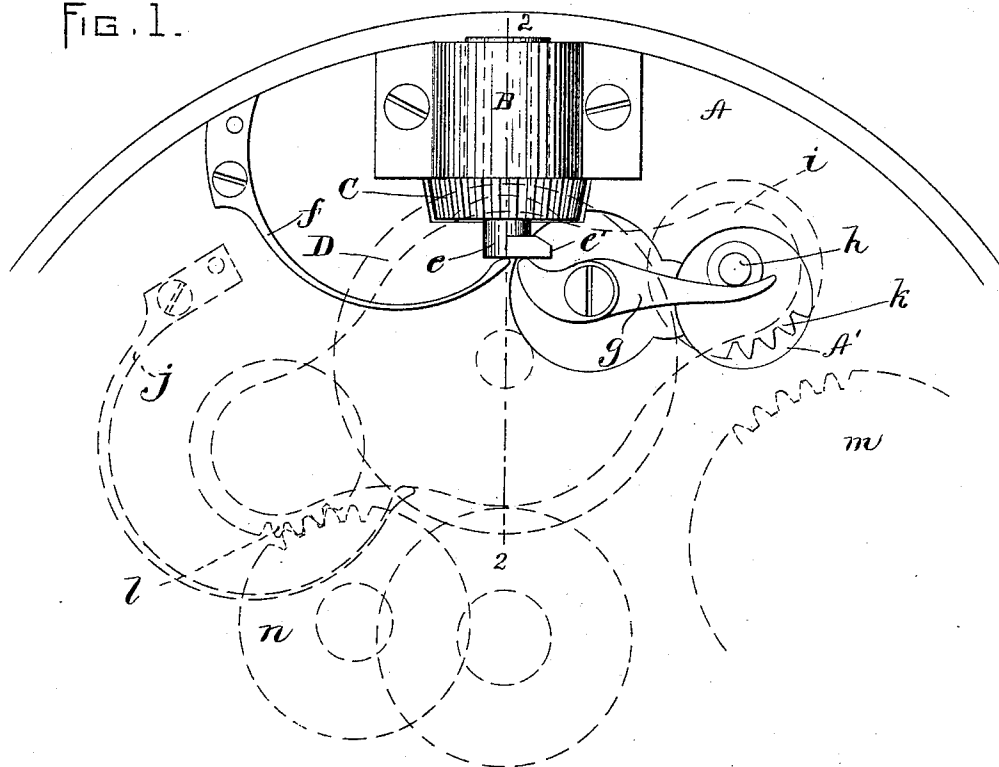


FIG. 2.

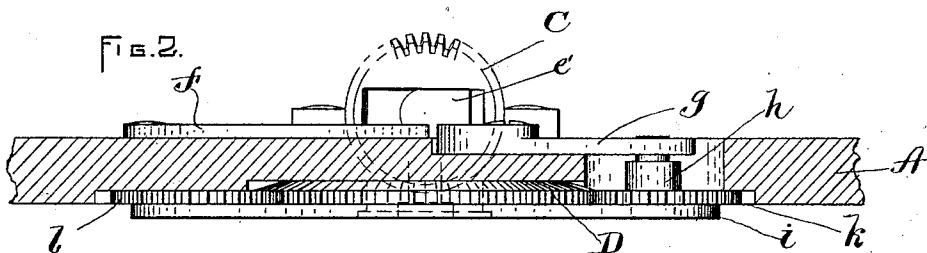


FIG. 4.

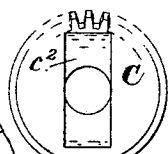


FIG. 3.

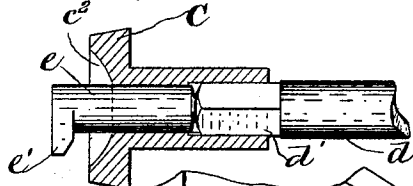
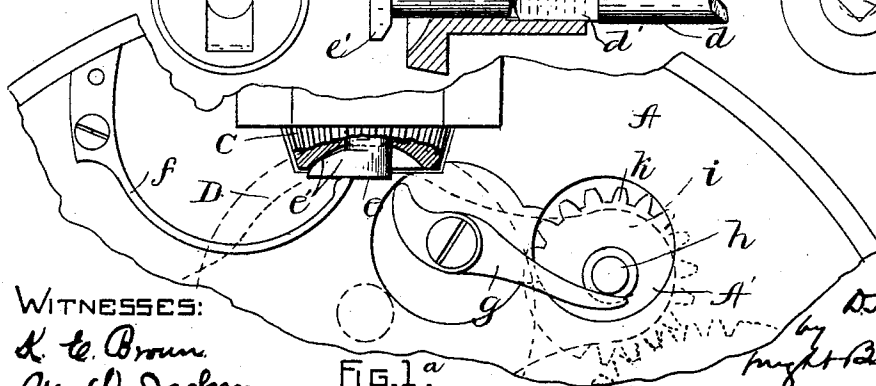
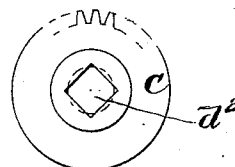


FIG. 5.



WITNESSES:

H. C. Brown.
W. D. Jackson

FIG. 1a

INVENTOR:

D. H. Church
by H. C. Brown, Attorney

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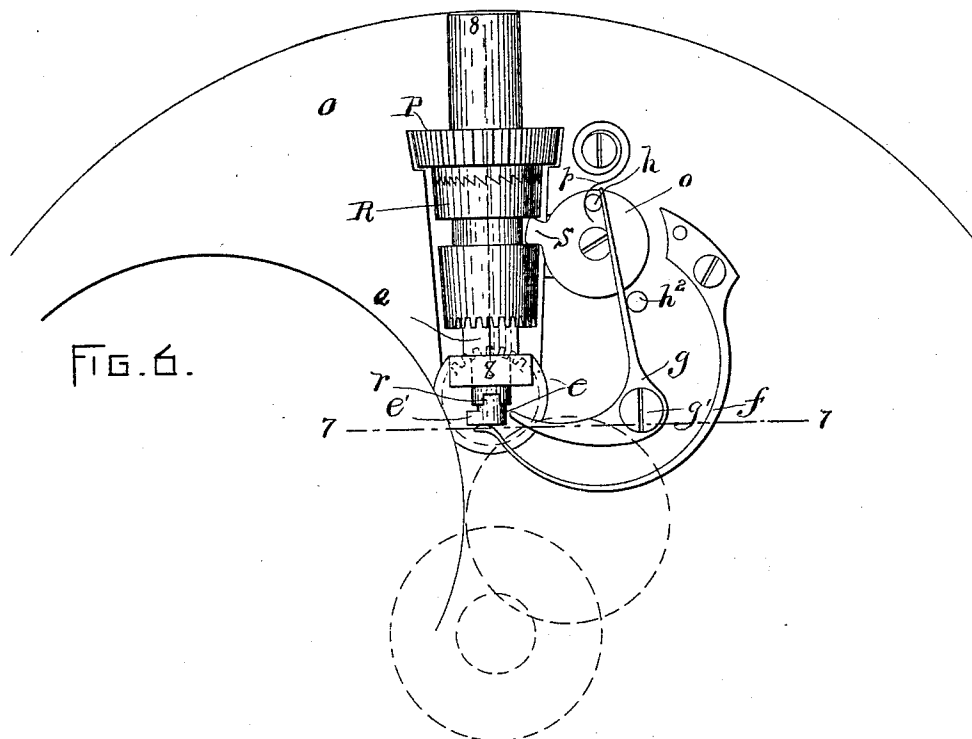


FIG. 6.

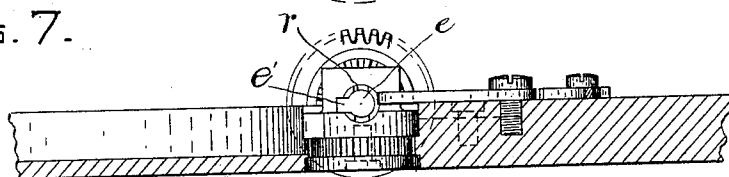


FIG. 7.

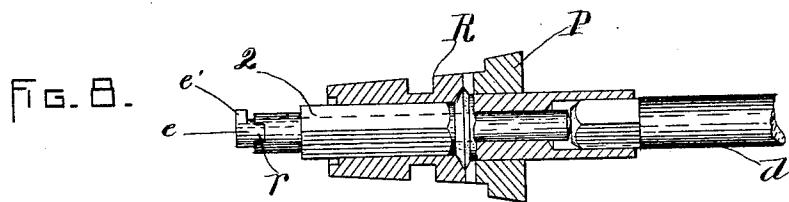


FIG. 8.

WITNESSES:

H. C. Brown

Mr. W. Jackson

INVENTOR:

D. H. Church
by Hight Brown Crosby
Atty.

UNITED STATES PATENT OFFICE.

DUANE H. CHURCH, OF NEWTON, MASSACHUSETTS.

STEM WINDING AND SETTING WATCH.

SPECIFICATION forming part of Letters Patent No. 520,633, dated May 29, 1894.

Application filed November 5, 1892. Serial No. 451,119. (No model.)

To all whom it may concern:

Be it known that I, DUANE H. CHURCH, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Stem Winding and Setting Watches, of which the following is a specification.

In modern watch construction the winding of the mainspring is performed by means of a fixed winding bar or key, placed in the axis of the case pendant, and connected with the mainspring arbor by means of intermediate gear wheels, thus obviating the use of an independent key. By means of certain cams or levers, or of small studs, or pins, projecting slightly from the edge of the watch case, the winding bar, or key, can be disengaged from the mainspring arbor and so shifted as to connect with the wheels of the "dial train" so called, for the purpose of moving the hands. A later improvement in construction makes it possible to perform the shifting operation by an endwise movement of the winding bar, thus abolishing the need of the before mentioned projecting push pins or levers. This form of construction, while possessing the merit of convenience, and simplicity of operation, has been objected to, on the claim that there is danger of the mechanism being accidentally shifted into the hands setting position, and the hands being moved so as to fail to show correct time. To obviate this objection, and at the same time secure a simple form of mechanism, which will allow the ready interchange of movements and cases, is the object of my present invention; which will be readily understood by the following description, together with the accompanying drawings, forming part of this specification.

In the drawings, Figure 1 shows my improved device, adapted to a full plate watch movement, in which the shifting wheels are attached to, and carried by a vibrating or rocking yoke. Fig. 1^a is a view of a part of Fig. 1, showing the parts in position for winding. Fig. 2 shows a transverse section on line 2, 2, Fig. 1. Fig. 3 shows a section of the winding pinion and a portion of the winding bar or key, also a side view of a shiftable pin, constituting a part of my improvement. Figs. 4 and 5 show respectively a front and a rear side elevation of the winding pinion. Fig. 6

shows my device as applied to watches in which a sliding clutch is substituted for the vibrating or rocking yoke. Fig. 7 shows a section on line 7 7. Fig. 8 is a section on line 8 8, Fig. 6 showing the sliding clutch and the winding pinion, and a partial section of the winding arbor.

In all the figures any given letter indicates the same part.

In Figs. 1 and 2, A represents a portion of the pillar plate of a full plate watch.

B represents the winding bridge, which forms the bearing for the winding pinion C.

d, Fig. 3, is a portion of the winding bar, terminating in the squared portion d' which enters the squared hole d², Fig. 5, in winding pinion C.

e is a sliding pin, having at one end a projecting portion or toe e'.

f is a spring acting to press the sliding pin e into a groove e² in the winding pinion C.

g is a swinging lever, one arm of which is resting against a stud h which projects through a hole A' in the plate A from the rocking yoke i (which is shown in dotted lines) on the axis of which is a bevel or crown wheel D engaging with wheel k at one end and wheel l at the other end, both of which wheels are carried by said yoke, wheel k being designed to mesh into winding wheel m on the mainspring arbor; and wheel l to mesh into the minute wheel n in which position it is shown in the drawings.

J is a spring, acting to press the rocking yoke into the position in which the winding of the mainspring can be performed.

The operation of my device is as follows:

When the mechanism is in the position indicated in the drawings, it is evident that if motion is imparted to the winding pinion C (in the usual manner) such motion will be communicated through crown wheel D to intermediate wheels k and l and through intermediate wheel l to the minute wheel n, thus moving the hands of the watch. When it is desired to place the mechanism in position for winding the mainspring, an outward endwise movement is given to the winding bar d by pulling on the pendant crown. As the winding bar is partially withdrawn from the winding pinion C it will be followed by the sliding pin e owing to the pressure upon it of

the spring *f*, which will cause the toe *e'* to enter the groove *c*² in the face of the winding pinion when the groove and toe are brought into coincidence by the movement of the pinion. Then a half turn of the pinion will carry with it the toe *e'* of pin *e* away from contact with swing lever *g*, which when the parts are in the position shown in Fig. 1 operates to hold the yoke in the position for setting the hands. The pressure of lever *g* being removed, the spring *J* will immediately swing the yoke into position for winding the main spring as shown in Fig. 1^a. But in turning the sliding pin *e* the half revolution its toe *e'* will abut against the surface of the plate *A* and prevent further rotation until the operator exerts an inward pressure on the winding bar *d*, thus forcing toe *e'* of the sliding pin *e* out of engagement with the winding pinion, and allowing the winding pinion to turn freely, and through the connected action of wheels *D* and *k* effect the winding of the main spring. An outward pull of the winding bar and a half turn in the opposite direction, will carry the toe *e'* over to its previous position for the operation of hand setting, and when the bar is again pushed in, the toe *e'* will be released from engagement with the winding pinion and at the same time press against lever *g* and so swing yoke *i* into its hand setting position.

In the other form of my device shown in Figs. 6, 7 and 8, *O* represents a portion of a watch plate, *P* the winding pinion mounted loosely upon the winding arbor *Q*, while *R* shows the sliding clutch or sleeve also mounted on the squared portion of the winding arbor. *e* is a shiftable pin fitted to slide and turn in an axial hole in winding arbor. *d* is a portion of the winding bar, the squared end of which enters the squared hole in the winding arbor *Q*. The other end of the winding bar (not shown) extends outward through the case pendant in the usual way. *f* is a spring, giving an endwise pressure on sliding pin *e* to maintain the pin in contact with the inner end of winding bar *d*. *g* is a bell-crank lever, pivoted at *g'*, the shorter end of which is arranged to receive pressure from, and be moved by sliding pin *e*. The longer arm of lever *g* is made slender so as to act as a spring, and engages with a stud or pin *H* on a disk *o*. *h*² is a stop pin to prevent lever *g* from swinging too far. *p* is a spring pressing against pin *h* and acting through arm *S* of disk *o* to hold spring clutch *R* in engagement with the clutch teeth of pinion *P*. This form of device is manipulated in the same manner as the one previously described.

The drawings show the mechanism in position for winding the mainspring. When it is desired to set the hands, the winding bar is pulled outward a short distance and the pressure of spring *f* will force the sliding pin *e* in the same direction. If needful, a slight rotation of the winding bar will cause a slot or recess *r* in its end to coincide with toe *e'*

of sliding pin *e*, which will enter the slot, when a half turn of the arbor to the left will carry the toe to position opposite the shorter end of crank lever *g*. When in this position, an inward movement of the winding bar will force the toe against the arm of the lever, causing it to swing on its stud *g'* and the longer arm of the lever pressing against pin *h* will impart a movement to disk *o* which by means of its arm *S* will cause clutch *R* to be disengaged from pinion *P* and, sliding on the squared portion of the arbor *q*, engage the gear teeth, on opposite end of the clutch, with corresponding teeth of the intermediate setting wheel *t*. A reversal of the foregoing manipulation will return the parts to the winding position.

It will be seen that movements provided with the described improvement are freely interchangeable in different cases, there being no positive connection between the movement and case. It will also be seen that said improvement provides absolute security against accidental movement of the hands, first because the movement being normally in condition for winding, and secondly because it is impossible to make the hands setting mechanism operative without an especial manipulation of the winding arbor, which cannot be caused accidentally.

I claim—

1. As an improvement in stem winding and setting watches, a watch in which the winding and setting mechanism is adapted to have its engagements changed by a longitudinal movement of the winding-bar in one direction, and to then be rendered operative only under a partial rotation of the said bar and a longitudinal movement thereof in the opposite direction.

2. A stem winding and setting watch, having winding and hands setting mechanism, a shiftable pin yieldingly pressed against the winding bar and movable endwise therewith, and a device rotatably connected with the winding bar and adapted to rotatively connect with said pin, as set forth.

3. In a stem winding and setting watch having winding and hands setting mechanism, said hands setting mechanism including a longitudinally movable and rotary pin having a toe or projection at one end and yieldingly pressed against the inner end of the winding bar, and a device such as a sleeve with which the winding bar is rotatively engaged and in which it is longitudinally movable, said device having a slot or recess formed to receive said toe and thus enable the winding bar to rotate the pin, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 25th day of October, A. D. 1892.

DUANE H. CHURCH.

Witnesses:

M. A. JACKSON,
ARTHUR W. CROSSLEY.