(No Model.)

I. WILLIAMS.

WATCH KEY.

No. 502,060. Patented July 25, 1893.

FIG. 1.

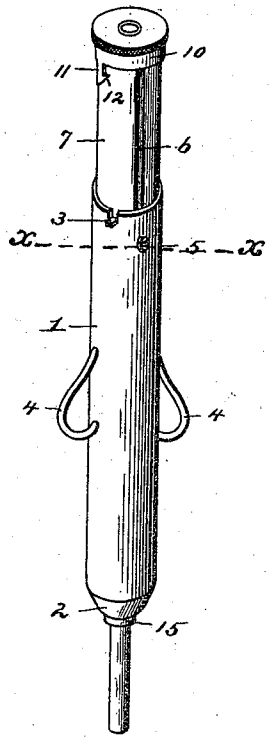


FIG. 2.

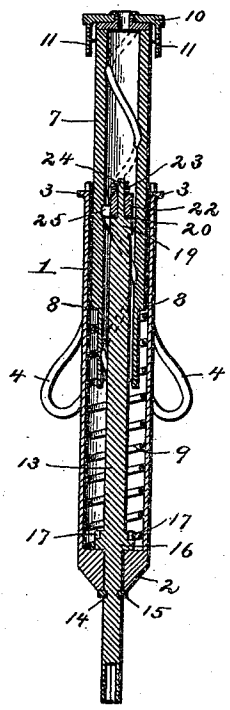


FIG. 4.

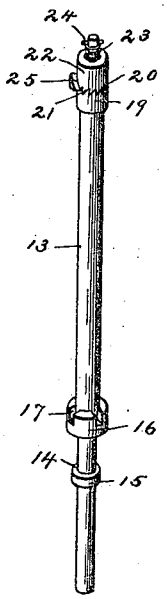


FIG. 3.

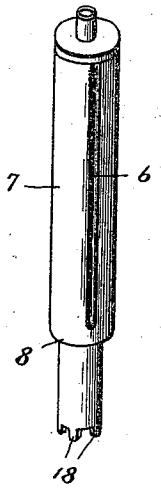


FIG. 5.

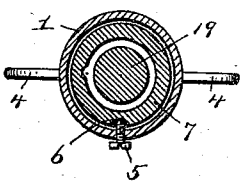
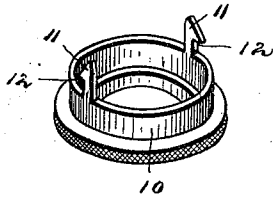


FIG. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

IRVIN WILLIAMS, OF NELSON, MISSOURI.

WATCH-KEY.

SPECIFICATION forming part of Letters Patent No. 502,060, dated July 25, 1893.

Application filed March 20, 1893. Serial No. 466,811. (No model.)

To all whom it may concern:

Be it known that I, IRVIN WILLIAMS, a citizen of the United States, residing at Nelson, in the county of Saline and State of Missouri, have invented a new and useful Watch-Key, of which the following is a specification.

This invention relates to watch-keys and has for its object to provide a device of the character set forth that is automatically wound and unwound by having multiplied revolutions imparted thereto by the downward pressure of the top of the key, or it may be arranged as a solid key, and is capable of being converted into other tools or devices without materially altering the construction.

With these and other ends in view, the invention consists of the construction and arrangement of the parts thereof as will be more fully hereinafter described and claimed.

In the drawings: Figure 1 is a perspective view of a watch-key contemplating the invention. Fig. 2 is a central longitudinal section, taken through the device in a vertical plane. Fig. 3 is a detail perspective view of the inner barrel. Fig. 4 is a similar view of the main shaft and the parts carried thereby. Fig. 5 is a sectional view on the line x—x of Fig. 1. Fig. 6 is a detail view of the rotary cap on the outer end of the inner barrel.

Similar numerals of reference indicate corresponding parts in the several figures of the drawings.

Referring to the drawings, the numeral 1 designates the outer barrel, with a conical end 2, having an opening therethrough at the lower end of the same, and the inner upper termination of said lower end forms a shoulder for engagement with the internal operating parts. The upper end of the said barrel is formed with diametrically-opposed lugs 3, and in the body of said barrel are ears or loops 4, to aid in holding the barrel when the key is in operation. The said barrel 1 is also provided with a screw-opening near the upper end thereof in which is fitted an adjustable screw 5, that extends through the adjacent inner side of the barrel and engages a groove 6 extending longitudinally a proper distance of an inner barrel 7, to limit the movement of said inner barrel and prevent separation of the latter from the outer barrel. In this connection it will be understood that the screw 5 and groove 6 may be duplicated, and a similar construction and arrangement be employed on the opposite side of the said barrels 1 and 7 for a similar purpose. A short distance above the lower end of the inner barrel 7 a shoulder 8 is formed, and from the said shoulder downwardly to its lowermost termination the said barrel is contracted in diameter and thereon is fitted the upper part of a coiled lifting-spring 9, that has its lowermost end bearing against the lower shoulder of the outer barrel 1. The function of the said spring 9 is to lift the inner barrel 7 after the latter has been depressed in the barrel 1, and the upper end of the said barrel 7 is provided with a cap 10, having depending diametrically-opposed tongues 11, with oppositely-extending shoulders 12, that are caused to engage the lugs 3 at the upper end of the outer barrel 1, to lock the key in solid form for use as an ordinary watch-key, and which operation will be accomplished by simply turning the cap which is loose on the upper end of the inner barrel 7, until the shoulders 12 of the tongues 11 properly engage the lugs 3.

Centrally extending through the inner barrel 7 and the outer barrel 1 is an operating-shaft 13, having a circumferential groove 14 adjacent to the lower end thereof, and when the said shaft 13 is in proper position relatively to the barrel 1 the said circumferential groove 14 is adjacent to the lower termination of the lower conical end of the outer barrel, and when in said position a link 15 is fitted in said groove and secured to prevent the said shaft from being pushed upward through the barrels 1 and 7.

Adjacent to the circumferential groove 14 in the shaft 13, is located a circumferential shoulder 16, having teeth 17 in the upper side thereof that are intended to be engaged by teeth 18, formed at the lower end of the inner barrel 7, when the said inner barrel is locked down to make the key solid and operate as an ordinary watch-key to prevent turning of the inner barrel. The said shoulder 16 is situated at such a distance from the circumferential groove 14 that when the shaft is in position in the barrels, said shoulder will bear on the shoulder at the lower end of the outer barrel and thereby properly hold the shaft in position within the said barrels.

Adjacent to the upper end of the shaft 13 is another circumferential shoulder 19, having teeth 20 on the upper side thereof that are engaged by teeth 21 carried by a ratchet-wheel 22 rotatably fitted on the said shaft above the shoulder 19 and whose teeth are kept in engagement with the teeth 20 by a spring 23 surrounding the shaft 13 and bearing against the upper end of the ratchet-wheel 22 at its lower termination and against a key 24, extending through the shaft at the upper termination thereof. The ratchet-wheel 22 is formed with one or more cam-lugs 25 that fit one or more cam-grooves extending vertically over the interior surface of the inner barrel 7, and the said cam lugs and grooves operate to turn the shaft 13 by pressing downwardly on the cap 10 and forcing the inner barrel 7 downward against the action of the lifting-spring 9 in the outer barrel 1. The lower end of the shaft 13 is supplied with a key-post opening of suitable configuration that is intended to take over the key post of a watch or clock or other device to be wound. The lifting spring 9 is of sufficient strength to lift the inner barrel when the same has been pressed down, and by pressing down the said inner barrel the shaft 13 is caused to make one or more revolutions, thereby providing means for easily, safely, and rapidly winding the main spring of a watch or clock or other device. The ratchet-wheel 22 engaging the teeth 20 of the shoulder 19, on the downward pressure of the inner barrel, causes the shaft to be revolved, but when the inner barrel is released and is acted upon by the lifting spring the said ratchet-wheel is disengaged from the teeth 20, and thereby a backward movement of the shaft is prevented because the cam-lugs on the said ratchet-wheel, acting in the cam-grooves, do not have a downward pressure exerted thereon.

It will be understood that other tools may be substituted for the socket in the lower end of the shaft if desired, and in this instance the inner barrel may have spiral grooves so arranged that the said shaft can be made to revolve to right or left by using different inner barrels.

The advantages over other keys are that in the present instance a partially automatic operation is acquired with less danger of the keys slipping and breaking the main spring. When the key-hole or socket is worn out it may be readily replaced by another by attaching it to the lower end of the shaft.

In converting the watch-key to other uses the several tools are attached to the lower end of the shaft and may be placed in the key-hole or socket.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having described the invention, what is claimed as new is—

1. In a watch key of the character set forth, the combination of an outer barrel having a screw extending inwardly from one side thereof, an inner barrel having a groove extending longitudinally of the same engaged by the inner projecting end of said screw, and provided with a lower reduced end to form a shoulder with the teeth at the lower end of the said inner barrel, a movable cap on the upper end of said inner barrel with depending tongues having oppositely-extending shoulders, the upper end of the outer barrel having oppositely-extending lugs to engage the shoulders of said tongues, a rotatable shaft centrally mounted in the inner barrel and extending through the outer barrel and provided with a lower shoulder having teeth in the upper side thereof arranged to be engaged by the teeth at the lower end of the inner barrel, and a lifting spring for forcing the inner barrel upwardly, substantially as described.

2. In a watch key of the character set forth, the combination of an outer barrel having oppositely-extending lugs at the upper end thereof, a spring-actuated inner barrel movably mounted in the aforesaid barrel and having a rotatable cap at the upper end thereof with depending shouldered tongues arranged to engage with the lugs at the upper end of the outer barrel, and a shaft extending through the said barrels, substantially as described.

3. In a watch key of the character described, the combination of an outer barrel, an inner barrel mounted in said outer barrel and having a spiral groove on the inner surface thereof, a lifting spring mounted in the outer barrel and bearing against the inner barrel, a shaft extending through said barrels and having a key-socket at the lower end of the same and a shoulder adjacent to the upper end with teeth in the upper side thereof, a ratchet-wheel having a cam lug thereon to engage the spiral groove of the inner barrel and teeth to coact with the teeth of the said shoulder, a spring surrounding the shaft above the said ratchet-wheel, and a key extending through the upper end of the shaft to hold the spring in place, whereby the said ratchet-wheel is permitted to have a movable action on the shaft, substantially as described.

4. In a watch key of the character set forth, the combination of an outer barrel having a shoulder at the bottom thereof, an inner barrel movably mounted in said outer barrel, a lifting spring normally holding said inner barrel elevated in the outer barrel, a shaft extending through the said barrels and projecting below the lower end of the outer barrel and provided with a shoulder that bears on the shoulder of said outer barrel, and also with a circumferential groove that is located adjacent to the lower terminating end of said outer barrel, said shaft being revolved by the operation of the inner barrel, and a link fitted in and surrounding said circumferential

groove and arranged to bear against the lower terminating end of the outer barrel to prevent the shaft from being forced upwardly in the said latter barrel, substantially as described.

5. In a watch key of the character set forth, the combination of an outer barrel having oppositely-extending lugs at the upper end thereof and a shoulder at the lower end of the same, and also having engaging ears in the body thereof, a screw extending through the said outer barrel, a spring-actuated inner barrel movably mounted in the aforesaid barrel and having a rotatable cap at the upper end thereof with depending shouldered tongues arranged to engage the lugs at the upper end of the outer barrel and also provided with a longitudinally-disposed groove into which extends the inner end of the said screw, said inner barrel being provided with teeth at the lower end of the same, a shaft extending through said barrels having a key-socket at the lower end of the same, a shoulder near the said key-socket with teeth in the upper edge thereof, and a shoulder adjacent to the upper end also formed with teeth in its upper edge, a ratchet-wheel movably mounted on the shaft above the upper shoulder and having a cam lug arranged to engage a spiral groove in the inner barrel, a spring mounted on said shaft above said ratchet-wheel, and a key extending through said shaft above said spring, substantially as described.

6. In a watch key, the combination of an outer barrel provided with handles or loops 4, with the inner barrel guided in the outer barrel and held from rotary movement by means substantially as described, the interior surface of the inner barrel being formed with a spiral groove, the coiled spring arranged within the outer barrel and bearing against the inner barrel, and the winding-shaft passing through the outer barrel and received at its inner end within the inner barrel and provided with a lug to engage the spiral groove, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

IRVIN WILLIAMS.

Witnesses:
W. B. HAYNIE,
P. M. SANDIDGE.