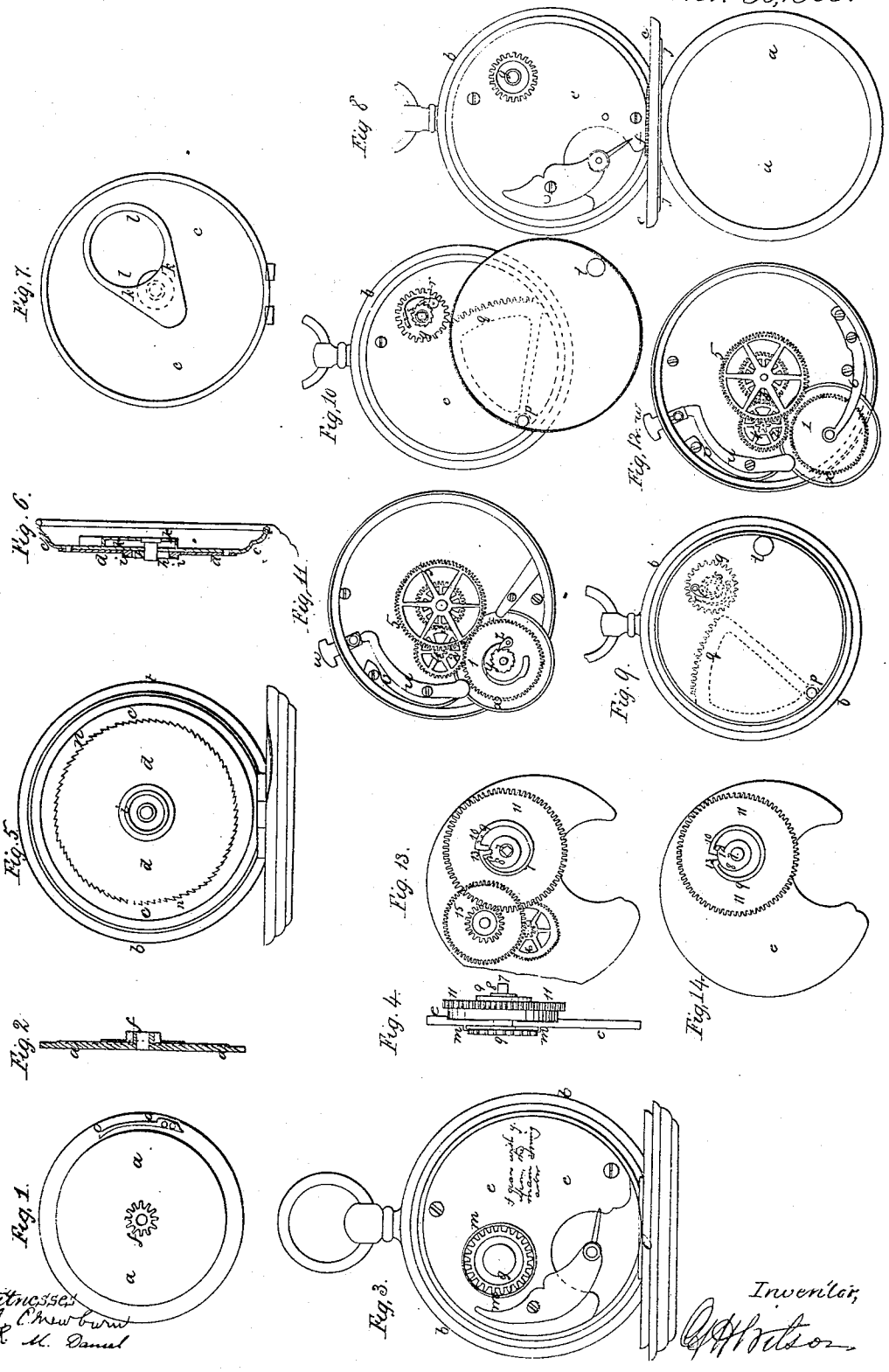
C. H. Wilson.

Winding Watches.

No. 97,466. Patented Nov. 30, 1869.



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G. H. WILSON, OF LONDON, ENGLAND, ASSIGNOR TO HENRY WM. DEE AND LOUIS DEE, OF SAME PLACE.

IMPROVEMENT IN WATCH-WINDING ATTACHMENTS.

Specification forming part of Letters Patent No. **97,466**, dated November 30, 1869.

To all whom it may concern:

Be it known that I, GEORGE HENRY WILSON, of London, England, have invented certain new and useful Improvements in Watches and other Time-Keepers; and I do hereby declare that the following is a true, full, and exact description thereof, reference being had to the annexed drawings—that is to say:

The primary object of my invention is to wind and to set or adjust the hand from the outside, and thereby to avoid the necessity of opening the case, and to dispense with the key-hole usually required to effect these operations, by which all chance of dust or dirt getting into the works during these operations is prevented, while at the same time I dispense with the use of a key.

The first part of my invention consists in a disk, which forms part of the ordinary hinged or swinging back of a watch and the medium for winding the watch.

In carrying out this improvement the portion of the watch which is made to revolve—say, the back of the case—carries a wheel which gears into another wheel on the mainspring-arbor. I introduce a friction-plate between the revolving back and the dome, and to prevent any dirt getting into the watch from between the revolving back of the case and the dome I form a rim or ring round an aperture in the friction-plate, in which the wheel carried by the back revolves, and I apply below the dome a plate having a circular aperture, which exactly fits over a cup or ring round the wheel on the mainspring-arbor. The rim or ring on the friction-plate prevents the ingress of dirt; but should any get past this rim it is stopped by the cup or ring round the wheel on the mainspring-arbor. To prevent accident by winding the wrong way, the under rim of the revolving back is toothed, and a spring or pawl takes into the teeth as the revolving back is moved round. For this purpose I attach a spring-pawl to the inside of the revolving back to take into ratch-teeth on the edge of the friction-plate. This part of my invention will be understood by figures 1 to 10 of the accompanying drawings.

Figures 1 to 7 show a watch in which the winding is effected by rotating the back. Fig. 1 is an inside view of the back, and Fig. 2 is a section. Fig. 3 is a face view, and Fig. 4 a section, of the upper plate of the watch. Fig. 5 is a view of the back or outside face; Fig. 6, a section, and Fig. 7 a view of the inside face of the dome. *a* is the back of the watch; *b b*, the band; *c*, the dome; *d*, the friction-plate, and *e* the upper plate. The back *a* is free to rotate on its center, where it carries a wheel, *f*, which gears into a wheel, *g*, on the mainspring-arbor. The friction-plate *d* is introduced between the rotating back *a* and the dome *c*. *h* is an aperture in the friction-plate *d*, and in the dome *c*, in which aperture the wheel *f* revolves. *i* is a rim or ring on the plate *d* around the aperture *h* to prevent ingress of dirt. *k* is a plate below and attached to the dome *c*. This plate *k* has a circular aperture, *l*, which fits over a cup or rim, *m*, round the wheel *g* on the mainspring-arbor. This cup *m* prevents any dirt which may get past the ring *i* getting into the works. *n n* are ratchet-teeth on the edge of the friction-plate *d*. A spring-pawl *o* on the inside of the revolving back *a* takes into these teeth. In winding the watch, if the operator attempts to turn the back *a* in the wrong direction it is stopped by the pawl *o*. The manner in which the winding can be effected by winding the dome is simply to place the wheel *f* on the under side of the dome.

Fig. 8 shows how the winding may be effected in a fusee-watch, in which case the wheels *f* and *g* must continue to move when the watch is going. In this case I employ a separate disk, *j*, between the dome *c* and the back *a*. *f* is a wheel carried on the inside of the revolving disk *j*, and gearing into a wheel, *g*, on the fusee-arbor. The winding is effected by rotating the disk *j*.

Figs. 9 and 10 show an arrangement, chiefly for fusee watches, in which the winding is effected by causing the back *a* to turn not on its axis but on a pin *p*. The back *a* carries between itself and the dome a curved rack, *q*, which gears into the wheel *g*, which is mounted loosely on the fusee-arbor. The wheel *g* carries a pawl, *r*, which takes into a ratchet-wheel, *s*, fixed on the arbor. *t* is a stud outside the back to be used in moving the same. In moving the back *a* into the position seen in Fig. 10 the rack *q* causes the wheel *g* to rotate, and the pawl *r* takes into the ratchet-wheel *s*, and

thereby rotates this wheel and partly winds the mainspring; but in returning the back into its normal position, Fig. 9, the pawl *r* rides over the ratchet-teeth, and the wheel *s*, with the arbor, does not turn.

The invention relates, secondly, to setting or adjusting the hands without opening the case of the watch; and it consists of a circular plate, wheels, ratchet, detent, and springs. An arm or slide piece resting against the detent projects through the case, and when pressed releases a circular plate, which also projects through the case. By then rotating this circular plate a ratchet-wheel thereon actuates a spring-pawl on a toothed-wheel, so that rotary motion is imparted to this wheel. This motion is transmitted by an intermediate wheel to the wheel carrying the minute-hand. In some cases I arrange the mechanism so that when the circular plate is pressed it comes against a wheel, and when then revolved the motion is transmitted to the wheel carrying the hand. This part of my invention is represented in Figs. 11 and 12.

Fig. 11 is a face view of the watch with the dial-plate removed. Fig. 12 is a similar view of a modified arrangement. In Fig. 11, *u* is a detent, and *v* its spring. *w* is an arm or slide piece resting against the detent, and extending through the edge of the watch-case. The detent bears, as shown, upon and holds a circular plate or disk, *x*, which partly projects through the edge of the case. By pressing the arm *w* to release the disk *x*, and by then rotating this disk, a ratchet-wheel, *y*, thereon actuates a pawl, *z*, on a toothed wheel, 1, thereby imparting rotary motion to this wheel. This wheel 1 gears into another wheel, 2, and this wheel in its turn gears into wheel 3, carrying the minute-hand, while a pinion, 4, on the spindle of the wheel 2 gears into a wheel, 5, carrying the hour-hand. Should the operator turn the disk *x* in the wrong direction, the pawl *z* rides over the teeth of the wheel *y*, and the wheels 1, 2, 3, 4, and 5 do not turn. This arrangement applies to duplex striking and chronometer watches, in which the hands ought not to be moved backward. For watches in which the hands may be moved in either direction I prefer the modification shown in Fig. 12. Here the disk *x* is carried on the end of a spring-arm, 6, which in the normal position keeps the disk pressed out, as shown, so that the wheel 1 does not gear with the wheel 2; but when the disk is released from the detent *u*, as before explained, and the disk is pressed inward to cause the wheel 1 to take into the wheel 2, and by simultaneously rotating the disk in the required direction the hands are moved forward or backward as required.

The last part of my invention relates to preventing overwinding and to adjustment. It consists of a snail-piece and a bearing-spring to press thereon. The snail-piece is attached to the barrel or other arbor, and as the mainspring is being wound up the pressure of the bearing-spring on the snail-piece increases. The force of the mainspring is thus regulated, because as the power of the mainspring decreases the pressure of the bearing-spring decreases in proportion. The snail-piece and the bearing-spring are each provided with a stop or projection. These stops meet when the mainspring is sufficiently wound, and the breaking of the mainspring by overwinding is thus obviated. This will be found of great advantage in watches wound by rotating part of the case, as hereinbefore described, because in winding the watches in this manner the operator does not so readily feel when the watch is sufficiently wound as he does in winding by means of a key in the ordinary manner. This part of my invention is represented in Figs. 13 and 14. Fig. 13 shows the parts in their position when the mainspring is down or unwound, and Fig. 14 shows them when fully wound. 7 is the mainspring-arbor, and 8 is the snail-piece thereon. 9 is the bearing-spring, which is fixed at 10 to the main wheel or barrel 11 of the watch. 12 is the stop on the snail-piece, and 13 the stop on the spring. These stops 12 and 13 meet, as seen in Fig. 14, when the mainspring is fully wound. Instead of the main wheel 11 gearing into the wheel 14 of the ordinary train, I interpose intermediate wheels, 15 and 16, in order that about three-quarters of a turn of the barrel-arbor may suffice to wind the watch.

What I claim, and desire to secure by Letters Patent, is—

1. The rotating disk forming part of the ordinary hinged or swinging back or cap of a watch, and the medium for winding the watch, as described.

2. In combination with the rotating back, as described, the toothed friction-plate *d*, as and for the purpose set forth.

3. In combination with a projecting plate or disk, *x*, whereby the hands can be set and adjusted, a detent, *u*, spring *v*, and projecting arm *w*, as shown in Fig. 11, arranged and acting in the manner and for the purpose herein described.

4. A snail-piece, 8, with stop 12 on the mainspring-arbor, in combination with a bearing-spring, *q*, with stop 13, Figs. 13 and 14, as and for the purpose described.

In witness whereof I have hereunto set my hand this 29th day of August, 1868.

G. H. WILSON.

Witnesses:

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