

C. H. MEYLAN.

WATCH.

APPLICATION FILED AUG. 4, 1909.

Patented Mar. 22, 1910.

2 SHEETS—SHEET 1.

952,921.

Fig. 1

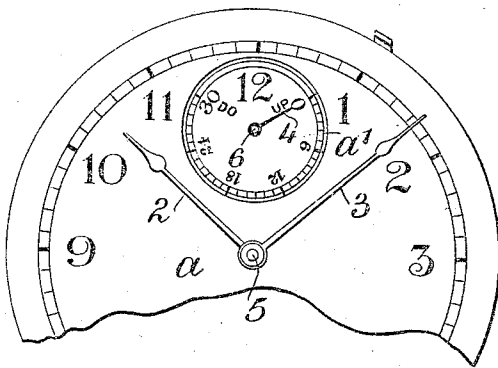


Fig. 2.

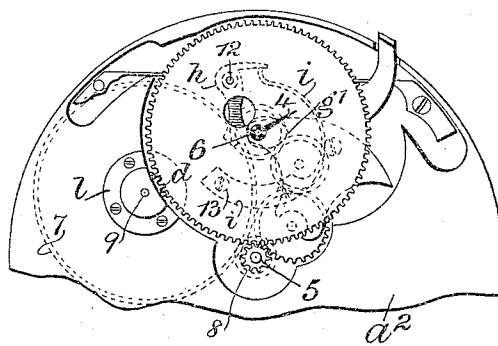


Fig. 3.

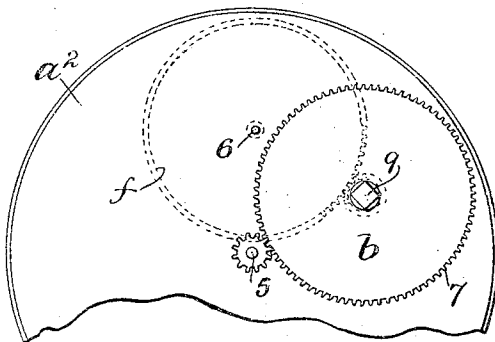
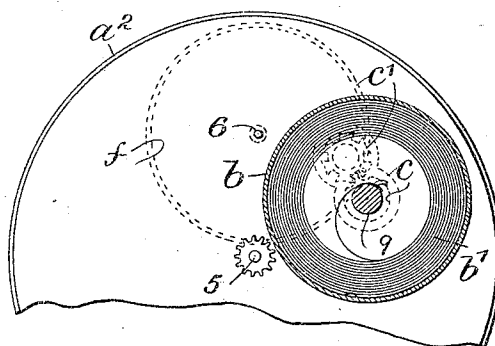


Fig. 4.



Witnesses:

Charles H. Smith
A. B. Serrell

Inventor:

By Charles H. Meylan.
Harold Serrell
his Attorney.

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2 SHEETS—SHEET 2.

Fig. 5.

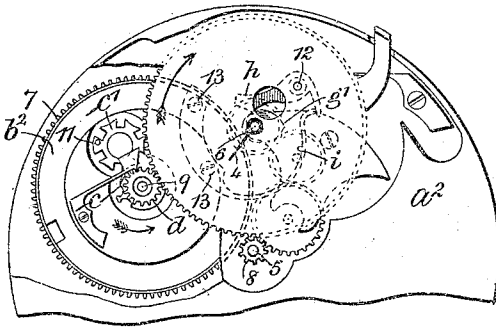


Fig. 6.

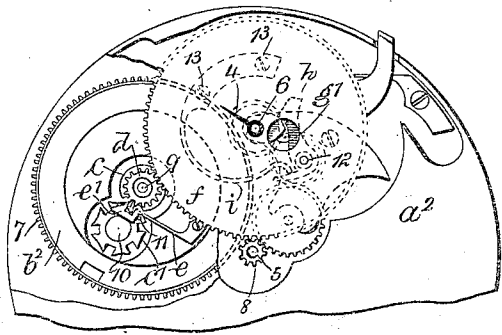


Fig. 7.

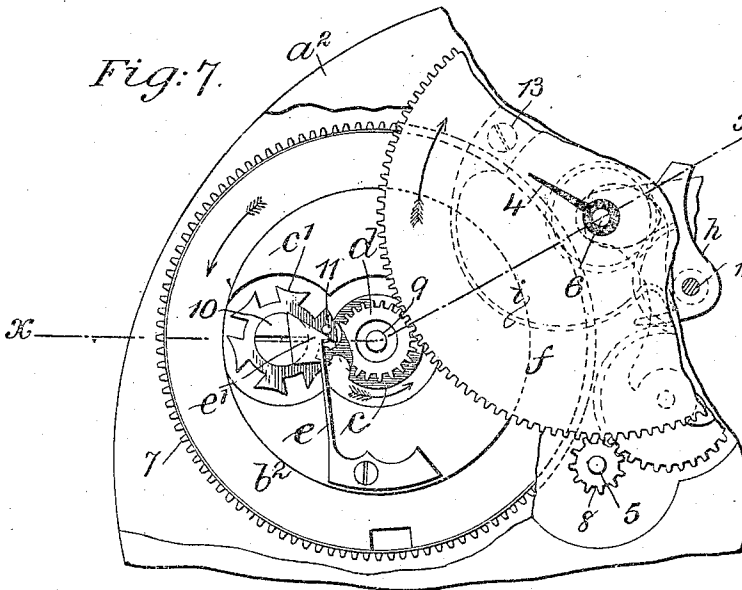


Fig. 9.

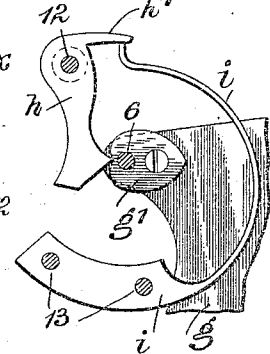


Fig. 10.

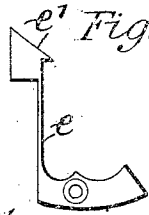
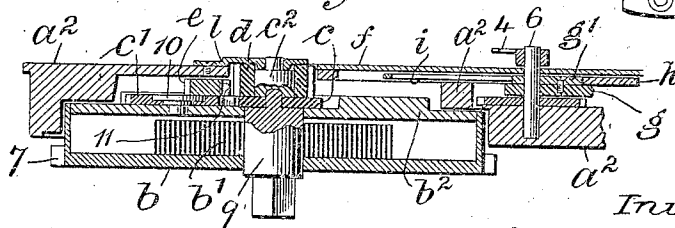


Fig. 8.



Witnesses:

Charles Smith
A. D. Serrell

Inventor:

By Charles H. Meylan
Harold Serrell
his Attorney.

UNITED STATES PATENT OFFICE.

CHARLES H. MEYLAN, OF BRASSUS, SWITZERLAND.

WATCH.

952,921.

Specification of Letters Patent.

Patented Mar. 22, 1910.

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To all whom it may concern:

Be it known that I, CHARLES H. MEYLAN, a citizen of the Republic of Switzerland, residing at Brassus, Canton of Vaud, Switzerland, have invented an Improvement in Watches, of which the following is a specification.

It is thought desirable in watches to be able to tell from an inspection of the dial if the main spring is fully or partially wound or run down, and in connection with such condition to return such indicating device to zero automatically at once that the main spring is wound up.

In the device of my invention I provide a small auxiliary dial on the face of the main dial marked off in hours agreeing approximately with the hours of the day or slightly in excess of the hours of the day, and a hand or pointer therefor. The gear of the spring barrel connects as usual to the time train of the watch and the usual winding means are provided for winding up the main spring. The top plate of the main spring barrel carries a Geneva stop and pin and a spring arm having a head and tooth. The arbor of the spring barrel carries a loose pinion above one of the members of the Geneva stop, and this pinion meshes with a large gear on the arbor of the hand of the auxiliary dial. This latter arbor passes freely through a heart-cam secured to the plate of the watch and on the under side of said large gear I secure a spring actuated hammer, the tooth of which bears upon the edge of the heart-cam. When the loose pinion is engaged by the tooth of the spring arm the pinion turns with the spring barrel in the running of the watch and causes the revolution of the large gear and movement of the hand. Substantially at the moment the spring of the spring barrel is fully wound up the tooth of the spring arm is disengaged and the pinion freed; the spring actuated hammer and heart-cam then automatically return the hand of the auxiliary dial to zero.

In the drawing, Figure 1 represents the larger portion of the main dial and the auxiliary dial and the hands thereof in their initial or starting position. Fig. 2 is a plan of the parts directly beneath these dials as if the dials were removed. Fig. 3 is a plan of the back of the plate shown in Fig. 2 and in

which the spring barrel is shown in full lines. Fig. 4 is a plan and partial section, the position of the parts being the same as in Fig. 3, except that the spring barrel is in section showing the main spring. Figs. 5 and 6 are plan views showing the mechanism beneath the dial and in both of which a part of the plate is removed so as to show the upper surface of the spring barrel. In Fig. 5 the mechanism is in the running down position and in Fig. 6 the mechanism is in position where the spring is entirely run down. Fig. 7 is a partial plan view but of exaggerated proportions with the parts shown in Fig. 6, and in substantially the full wound up position of the main spring and the mechanism just ready to return the hand to zero. Fig. 8 is a cross section of the parts shown in Fig. 7 on the dotted line *x, x*. Fig. 9 is a plan of the spring actuated hammer and heart-cam in the initial position of zero corresponding with Fig. 2. Fig. 10 represents the spring arm. Figs. 7, 8, 9 and 10 are not only of exaggerated size for clearness but of the same size.

Referring particularly to Fig. 1, *a* represents the main dial with the usual hour and minute hands 2 and 3. *a*¹ represents an auxiliary dial formed on the face of the main dial and provided with an indicator hand 4. As will appear from the drawing, this auxiliary dial occupies about two-thirds or a little more of a circle and is divided up evenly into five periods or series of divisions of six hour marks each from zero to 30, and the hand 4 from zero with the movement of the watch moves hour by hour with the watch either to the period of 30 hours when the watch is fully run down or to so much of the period of 30 hours as is passed over before the rewinding of the watch.

5 represents the arbor of the hour and minute hand, and 6 the arbor of the indicator hand.

b represents the spring barrel constructed with the usual gear 7.

*b*¹ is the spring within the barrel and *b*² is the top plate of the barrel.

*a*² represents the watch plate provided with various openings and cut in various levels upon both sides for the respective wheels and gears, and 8 is a pinion above the watch plate *a*² forming one of the usual train of

gears shown particularly in Figs. 2, 5, 6 and 7, extending from the arbor 5 to the arbor 6 and constituting the hand setting train generally employed; the pinion shown in Figs. 3 and 4 upon the opposite side of the plate a^2 meshing with the gear 7 of the spring barrel is one of the pinions or gears of the time train mechanism extending from the spring barrel to the escapement and balance wheel and forming no part or connection with my present invention.

9 is the arbor of the spring barrel passing through the barrel and the top plate b^2 thereof and on through and slightly beyond the watch plate a^2 .

The members of the usual Geneva stop are the toothed disk c secured to the arbor 9 and the cam wheel c^1 on the stud 10 secured to the top plate b^2 of the spring barrel. These two members of the Geneva stop are of usual construction and perform their usual functions. The cam wheel member c^1 of the Geneva stop is provided with a pin 11. The reduced end of the arbor 9 (see Fig. 8) of the spring barrel and to which the toothed disk member c of the Geneva stop is secured is preferably provided with a nut c^2 serving to retain the disk c in position upon the arbor and provide a bearing at the same time for the loose pinion d which surrounds said nut.

I provide a spring arm e with a head and tooth e^1 on its free end. The spring arm is secured to the top plate of the spring barrel and the tooth e^1 adapted to engage any one of the teeth of the loose pinion d . This loose pinion d meshes with a large gear f which as will appear from Fig. 8 is on about the level of the upper surface of the watch plate a^2 , and this gear is secured to the arbor 6 of the hand 4.

g represents a watch plate having secured thereto a heart-cam g^1 and the arbor 6 passes through this heart-cam through the watch plate g and into the watch plate a^2 . Upon the under surface of the gear f is a hammer h connected thereto by the pivot pin 12 having a tail-piece h^1 , and a spring arm i is secured by screws 13 to this gear f ; the free end of this spring arm being bent to bear against the tail-piece h^1 of this hammer so as to cause the tooth of the hammer (see Fig. 9) to bear against the edge or periphery of the heart-cam.

I have shown and prefer to employ a small top plate l having a center for the upper end of the arbor 9 and secured to the upper surface of the watch plate a^2 ; this top plate l preferably having a collar at the opening for the top of the arbor 9, which when the parts are in position, is adapted to bear upon the upper surface of the nut c^2 (see Fig. 8).

Fig. 9 illustrates the position of the heart-cam and the hammer when the indicator

hand 4 points to zero as in Figs. 1 and 2. From this position with the running of the watch the indicator hand 4 shifts a point every hour and the tooth of the hammer leaves the position in Fig. 9 and moves gradually over the upper curved surface of the heart-cam as shown in Fig. 9, and nears the point of the heart-cam when the indicator hand 4 approaches the number 30 of the auxiliary dial, Figs. 5, 6 and 7.

Fig. 7 is drawn to indicate the wound up position of the spring barrel just before the moment when the parts are released to return the indicator hand 4 automatically to the position of zero.

It will be noticed from Figs. 5 and 6 that the tooth e^1 of the spring arm e engages one of the teeth of the loose pinion d , consequently the rotation of the spring barrel is thereby communicated to this loose pinion and from the same to the gear f and its arbor 6 and to the indicating hand 4, causing the same with the movement of the watch to shift a point every hour as the hours pass in the day and with the running of the watch.

In the running of the watch the spring barrel turns in the direction of the arrow thereon in Fig. 7, the barrel revolving about the stationary arbor 9, consequently the member c or cam wheel of the Geneva stop turns with the barrel against the tooth of the disk c of the Geneva stop, which is not moving; therefore the wheel c^1 is turned from the position, Fig. 7, a tooth at a time in the direction of the arrow, and this turning movement carries the pin 11 with the running down of the watch and the convex or stop surface of this cam movement from its position Fig. 7 around to a position where the pin 11 comes into the right angular notch below the head of the spring arm e and in which position the convex surface tooth of the cam wheel c^1 enters the notch in the toothed disk c and the watch stops, and it stops with the indicator hand 4, the hammer h , the gear f and the loose pinion d in the position shown in Fig. 7, and the spring arm e with its tooth engaging a tooth of the pinion and the members of the Geneva stop c c^1 and the pin 11 as in the position shown in Fig. 6. As the watch is wound up by the revolution of the arbor 9 and the toothed disk c of the Geneva stop, the cam wheel c^1 of the Geneva stop is turned a tooth at a time from the position described, toward and into the position shown in Fig. 7, so that just at the end of the winding up movement the pin 11 bears upon the inclined surface of the spring arm head, moving the same toward the center of the cam wheel c^1 and withdrawing the tooth e^1 from engagement with the teeth of the loose pinion d , and the moment this

tooth is withdrawn and the pinion becomes free, the force of the spring arm *i* acting upon the hammer with its tooth on the surface of the heart-cam, causes the rotation of the loose pinion and the gear *f* from the position Fig. 6 to the position Figs. 2 and 9, in which movement the indicator hand 4 is returned from whatever hour position it may have been pointing to (whether 24 or 30 or intermediate thereof) to the position of zero, and as the watch movement advances it only requires a slight turning movement of the spring barrel acting upon the tooth of the disk *c* to remove the pin 11 from its bearing upon the head of the spring arm *e* so that the tooth *e*¹ of said head engages one of the teeth of the loose pinion *d* and the indicator hand at once starts off to repeat the operations heretofore described.

In fuller explanation of the construction, relation and operation of the toothed disk member *c*, pinion *d*, the nut *c*² and the top plate *l* I desire to state that the upper reduced end of the arbor 9 is squared where the same passes through the member *c* of the Geneva stop, that the nut *c*² is cylindrical and is forced down tightly to place upon the arbor and against the member *c* to hold the same against any possible movement; that the nut being cylindrical forms a bearing for the pinion *d* which turns freely about the same while resting upon the member *c*, and the center of the plate *l* forms a top bearing for the arbor 9 and is so constructed as when in place to provide clearance for the free turning of the pinion *d*.

I claim as my invention:

1. In a watch and in combination, a dial, a main spring and barrel, means indicating from hour to hour the running down condition of the watch, devices connecting the main spring and said means, a Geneva stop device and devices actuated by said Geneva stop device upon the winding up of the main spring for permitting the automatic return of the indicating means to the zero position.

2. In a watch and in combination, a dial, a main spring and barrel, means indicating from hour to hour the running down condition of the watch, devices interposed between said barrel and means,—one of which is loosely mounted,—for moving the means through the hours to indicate the running down condition of the main spring and means actuated upon the completion of the winding up of the main spring for permitting the automatic return of the said indicating means to the zero position.

3. In a watch, the combination with a dial and a main spring and barrel, of an auxiliary dial spaced to indicate the hours from zero for and in excess of the hours of the day, a hand for the auxiliary dial, a large gear mounted on the arbor of said

hand, a pinion loosely mounted upon the arbor of the spring barrel, devices connected with said spring barrel and adapted for engaging the loose pinion, causing the pinion to turn with the spring barrel to actuate the indicating hand of the auxiliary dial, the relative sizes of said gear and pinion being such as to cause a predetermined movement of the hand of the indicator dial in proportion to the number of turns required of the spring barrel for the hours indicated.

4. In a watch, the combination with a dial and a main spring and barrel, of an auxiliary dial spaced to indicate the hours from zero for and in excess of the hours of the day, a hand for the auxiliary dial, a large gear mounted on the arbor of said hand, a pinion loosely mounted upon the arbor of the spring barrel, devices connected with said spring barrel and adapted for engaging the loose pinion, causing the pinion to turn with the spring barrel to actuate the indicating hand of the auxiliary dial, the relative sizes of said gear and pinion being such as to cause a predetermined movement of the hand of the indicator dial in proportion to the number of turns required of the spring barrel for the hours indicated, means for disengaging the devices holding the loose pinion and means adapted to come into operation upon the release of said loose pinion for automatically turning the pinion and the gear and swinging the hand of the auxiliary dial back to the zero position.

5. In a watch, the combination with a dial and a main spring and barrel, of an auxiliary dial spaced to indicate the hours from zero for and in excess of the hours of the day, a hand for the auxiliary dial, a large gear on the arbor of said hand and a loose gear on the arbor of the spring barrel, engaging and releasing devices acting upon the loose gear for causing the same either to turn with the spring barrel or be free thereof, a spring actuated hammer secured to one surface of said large gear, a stationary heart-cam secured to a plate of the watch and against the edge of which the nose of said spring actuated hammer is adapted to bear and by which devices said gears are rotated and the hand of the auxiliary dial is automatically returned to a zero position.

6. In a watch, the combination with a dial and a main spring and barrel, of an auxiliary dial spaced to indicate the hours from zero for and in excess of the hours of the day, a hand for the auxiliary dial, a large gear on the arbor of said hand and a loose gear on the arbor of the spring barrel, engaging and releasing devices acting upon the loose gear for causing the same either to turn with the spring barrel or be free thereof, a hammer pivotally connected to the inner surface of the large gear and hav-

ing a tail-piece and a tooth, a spring arm and body portion secured at the body portion to the same surface of the large gear as the hammer, with the free end of the spring arm bearing upon the tail-piece of the hammer, a watch-plate and a heart-cam secured thereto and through which the arbor of the hand of the auxiliary dial passes in an eccentric relation, the tooth of the hammer bearing upon the edge of the heart-cam so that when the loose pinion is released the said spring and hammer come into action to automatically turn said gear and pinion and return the said hand to its zero position.

7. In a watch, the combination with a dial and a main spring and barrel, of an auxiliary dial spaced to indicate the hours from zero for and in excess of the hours of the day, a hand for the auxiliary dial, an arbor on which said hand is mounted, a large toothed wheel or gear mounted on said arbor, a loose pinion on the arbor of the spring barrel meshing with the teeth of said gear, a spring arm secured to the top plate of the spring barrel and having a tooth and head with an inclined surface at the free end thereof, the tooth engaging the teeth of the loose pinion, a Geneva stop structure secured to the top of the barrel, the toothed disk of whose members is secured to the arbor of the spring barrel in a position adapted to turn the other member of the Geneva stop with the winding up of the watch, and a pin on the convex tooth of the cam wheel member of the said Geneva stop adapted to come against the inclined surface of the head of said spring arm to remove the tooth thereof from engagement with the loose pinion and so release the pinion and gear, and means adapted to act upon said release to automatically turn said gear and pinion and return the hand of the auxiliary dial to its zero position.

8. In a watch, the combination with a dial and a main spring and barrel, of an auxiliary dial spaced to indicate the hours from zero for and in excess of the hours of the day, a hand for the auxiliary dial, an arbor on which said hand is mounted, a large toothed wheel or gear mounted on said arbor, a loose pinion on the arbor of the spring barrel meshing with the teeth of said gear, a spring arm secured to the top plate of the spring barrel and having a tooth and head with an inclined surface at the free end thereof, the tooth engaging the teeth of the loose pinion, a Geneva stop structure secured to the top of the barrel, the toothed disk of whose members is secured to the arbor of the spring barrel in a position adapted to turn the other member of the Geneva stop with the winding up of the watch, and a pin on the convex tooth of the cam wheel member of the said Geneva stop

adapted to come against the inclined surface of the head of said spring arm to remove the tooth thereof from engagement with the loose pinion and so release the pinion and gear, a hammer pivotally connected to the inner surface of the large gear and having a tail-piece and a tooth, a spring arm and body portion secured at the body portion to the same surface of the large gear as the hammer with the free end of the spring arm bearing upon the tail-piece of the hammer, a watch-plate and a heart-cam secured thereto and through which the arbor of the hand of the auxiliary dial passes in an eccentric relation, the tooth of the hammer bearing upon the edge of the heart-cam so that when the loose pinion is released the said spring and hammer come into action to automatically turn said gear and pinion and return the said hand to its zero position.

9. In a watch the combination with the arbor of the spring barrel reduced at its upper end, the top plate of the spring barrel and the tooth wheel and cam wheel members of the usual Geneva stop connected respectively to said arbor and top plate, of a nut upon said arbor above the said tooth wheel, a top plate of the watch contacting with the nut and forming a top bearing for the arbor, a pinion surrounding the nut and loose, means for connecting it to turn with the top plate of the spring barrel, a large gear meshing with the pinion, an indicator hand and an arbor for said hand and large gear.

10. In a watch, the combination with the arbor of the spring barrel reduced at its upper end, and the tooth wheel member of a Geneva stop device through which said reduced end of the spring barrel passes, of a cylindrical nut upon said arbor above the tooth wheel forced down upon the arbor against the said tooth wheel to securely hold the same in place, a pinion surrounding the nut and loose, a top plate of the watch contacting with the nut and forming a top bearing for the arbor and the nut providing a bearing for the free turning of the pinion.

11. In a watch and in combination, a dial, a main spring and barrel, means indicating from hour to hour the running down condition of the watch, devices connecting the main spring and said means, a Geneva stop device, a spring arm movable with the spring barrel and a head and tooth at the free end of said spring arm adapted to engage one of the devices connecting the main spring and said means, a pin on one member of said Geneva stop for disengaging the tooth of said head, and a spring actuated means for returning the said means to the zero position.

12. In a watch and in combination, a dial, a main spring and barrel, an auxiliary dial spaced to indicate the hours from zero for

and in excess of the hours of the day and a hand for the auxiliary dial, a large gear on the arbor of the said hand and a loose pinion on the arbor of the spring barrel meshing therewith, a Geneva stop device, a spring arm movable with the spring barrel and a head and tooth at the free end of the said spring arm adapted to engage the said loose pinion, a pin on one member of said Geneva stop for disengaging the tooth of said head, 10 and a spring actuated means for returning the hand of the auxiliary dial to zero.

Signed by me this 19th day of April 1909.

C. H. MEYLAN.

Witnesses:

E. SIMON,
JEAN PIQUET.