This invention relates to mechanism and means for setting of hands of time pieces in general and more specifically to self-winding watches and clocks.

In self-winding watches and clocks, it has heretofore been necessary to utilize the usual type stem and knurled wheel extending from the watch casing to set the hands. Such a construction has definite drawbacks. The stem extending from the watch casing is susceptible of becoming engaged in articles of clothing and being subjected to knocking. Additionally and of far greater importance is the fact that the stem where it extends through the watch casing can not be made sufficiently tight to prevent moisture, water and dust from entering into the watch casing and affecting the delicate watch mechanism.

It is an object of the present invention to provide a hand setting mechanism which is wholly enclosed within a watch casing and which overcomes the drawbacks of prior constructions.

A further object of the invention is to provide in self-winding watches a hand setting mechanism having no projections external of the watch case, thereby permitting an absolute closed, hermetically sealed casing preventing any dust or moisture from entering into the watch casing.

A still further object of the present invention is to provide a hand setting mechanism for self-winding watches which is highly effective and yet simple in construction.

Other and further objects of the invention will be apparent from the following detailed description of a preferred embodiment of the invention taken together with the accompanying drawings in which:

Figure 1 is a bottom plan view of a watch mechanism having the bottom plate of the casing removed embodying the present invention, parts thereof being broken away for clarity;

Figure 2 is a partial sectional view through a clock mechanism embodying the present invention;

Figure 3 is a partial bottom plan view of the actuating means for setting the hands of a clock in normal position, parts being omitted for clarity; and

Figure 4 is a view similar to Figure 3 but showing the actuating mechanism in setting position.

In Figure 1 of the drawings there is shown in section a watch case 10 having a portion thereof shown at 11 which is flexible or deformable for purposes hereinafter to be set forth. The two portions of the watch case 10 and 11 are sealed one to another and the entire watch case is hermetically sealed to exclude all moisture and dust from entering therein.

In the watch case there are the usual mechanism carrying plates 13, 14 and the like on which are mounted the various gear trains, etc., necessary for operation of the clock mechanism. In Figure 1 only a portion of the gears forming the gear train are shown at 15 and 16. The remainder of the gear train is not disclosed in the drawings since it does not form a part of the present invention and is not essential to an understanding of the invention. The balance wheel 17 and speed regulator are shown however in Fig. 1 to provide proper orientation.

The minute hand 19 and hour hand 20 are shown in Figs. 1 and 2 of the drawings. The minute hand 19 is fixed on a rotatable shaft 21 which is journaled in plates 14 and 32. The plate 14 has fixed to the underside thereof a post 23 having an enlarged head 24. Mounted in the casing and slidably supported therein is a hand setting pusher fork generally designated 25. The pusher fork 25 has an elongated opening 26 through which the post 23 extends and the enlarged head 24 of the post maintains the relative relationship between the post and the pusher fork. Due to the arrangement of the elongated slot 26 with respect to the post 23, the pusher fork 25 is susceptible of movement, for example, as shown in Fig. 4, which is a combined sliding and pivoting movement. The pusher fork 25 has at the outer end thereof two arms 27 and 28 on the ends of which knobs or projections 29 and 30 are provided. Springs 31 and 32 are inserted between the arms 27 and 28 of pusher fork 25 and portions of the watch casing. These springs are for the purpose of returning the arms to a normal position after depression as will be explained hereinafter.

Secured on rotatable shaft 21 at the end thereof opposite to the position of the hands 19 and 20 is a gear 33. This is a ratchet gear having straight teeth thereon as shown in Figure 1. The pusher fork 25 has the spaced fork ends 34, 35 thereon provided with teeth for coaction with the toothed ratchet gear 33.

A spur gear 36 is secured to shaft 21 which actuates the hour hand 20 fixed on a collar 37 of a gear 38 through the rotatable gears 39, 40 which are fixed for rotation together on pivot 41. While the minute hand 19 is directly drivable by rotation of shaft 21, the gearings 36, 38, 39, 40 constitutes the differential gear train for the hour hand having the normal and usual twelve to one relationship of drive with the minute hand. Normal rotation of the shaft 21 from the main spring and clock mechanism is effected by means of spur gear 42 acting on and rotating gear 43. The gear 43 is loosely rotatably mounted with respect to the shaft 21 and has an extension 44 secured thereto. This extension obviously can be fastened to the gear 43 in any manner. Within this extension there is provided an insert 45 of resilient material in close frictional engagement with shaft 21. The gear 43, extension 44 and insert 45 comprises a friction drive for the shaft 21 and accordingly the hands 19 and 20. During normal operation of the clock or watch, this friction drive will transmit the driving power from the main spring for normal operation of the time mechanism.

When it is desired to set the hands 19 and 20, the hand set pusher fork 25 is actuated by depressing portion 11 of the watch case 10 either in proximity to the knob 29 or knob 30, depending upon the desired direction of movement of the hands. The normal position of the pusher fork is shown in Figures 1 and 3. If, for example, the hands are to be turned counter-clockwise, then the knob 29 and arm 27 of pusher fork 25 must be depressed and the pusher fork pivoted into a position as shown in Figure 4. This is effected by pushing on that portion of the case 11 in proximity to the knob 29. This portion of the casing being flexible and depressible permits the inward movement of the arm 27. When this movement occurs, the tooth on the fork end 34 is brought into engagement with a tooth on ratchet gear 33 and upon continued movement of the pusher fork 25, this ratchet gear will move through an angle corresponding to the angle of movement A in Figure 4 in the direction of the arrow in that figure. This move-
movement of the pusher fork effects an override with respect to the friction drive on the shaft 21. Depending upon the number of times that the arm 27 is depressed, the desired movement of the shaft 21 with a consequent movement of the hands 19 and 20 can be effected.

If it is desired to move the hands in a clockwise direction, then the arm 28 of the pusher fork must be depressed in a manner similar to that shown in Figure 4. After each depression of the arms 27 or 28, the springs 31 or 32 will return the arms to the normal position shown in Figures 1 and 3 of the drawings to place the arms in position for repeated movement by depression of the flexible portion 11 of the casing.

The portion 11 of the casing can be made in many different ways and of any flexible or depressible material such as thin metal or plastic. It can be made as an insert in the case or a thinner part of the case so long as the entire case is hermetically sealed. It is also contemplated that the entire watch case can be made flexible for the purpose of the invention.

Obvious modifications will be apparent to those skilled in the art to which the present invention pertains without departing from the scope and spirit of the invention as defined in the appended claim.

I claim:

In a watch, a casing, a portion of said casing being resilient and depressible, a shaft rotatably mounted in said casing, hands operatively associated with said rotatable shaft, a hand setting lever slidably and pivotally mounted in said casing, said lever being wholly contained in said casing and operatively contactable with said shaft for rotating said shaft upon movement of said hand setting lever to set said hands, said casing upon being depressed contacting and moving said hand setting lever, a ratchet gear secured on an end of said rotatable shaft, said hand setting lever having a forked end, teeth on said forked end adapted for coaction with said ratchet gear and means on the other end of said lever for inwardly and angularly moving said lever selectively in clockwise or counterclockwise direction to thereby contact and rotate said ratchet gear and said rotatable shaft, said lever having an elongated slot therein permitting said movement and rotation of said lever, said means for moving said lever comprising arms extending therefrom in opposite directions in close proximity to said resilient casing portion and spring means interposed between said arms and a portion of said casing biasing said arms and said lever to normal position.

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