

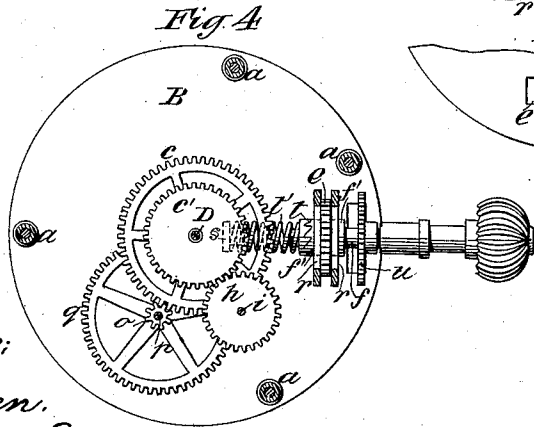
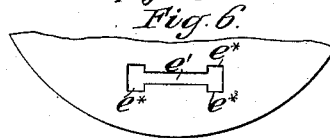
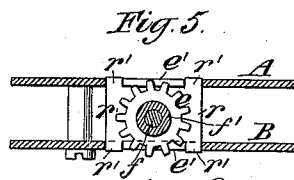
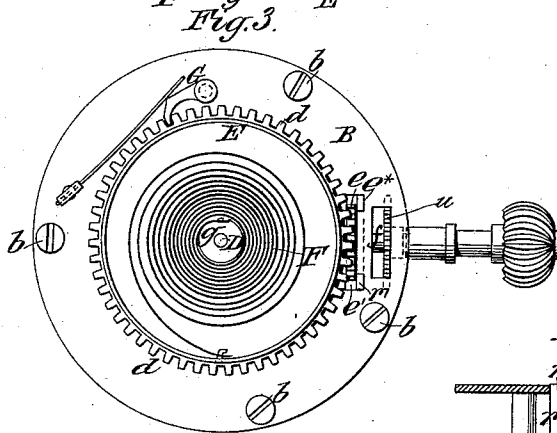
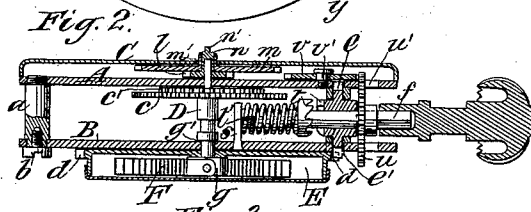
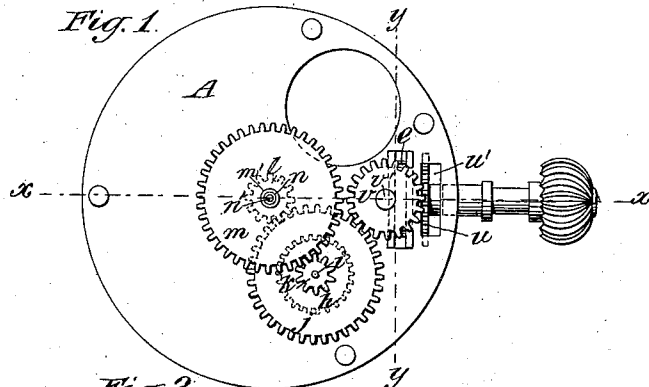
(No Model.)

W. D. DAVIES.

STEM WINDING AND SETTING WATCH.

No. 381,219.

Patented Apr. 17, 1888.



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UNITED STATES PATENT OFFICE.

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STEM WINDING AND SETTING WATCH.

SPECIFICATION forming part of Letters Patent No. 381,219, dated April 17, 1888.

Application filed December 1, 1887. Serial No. 256,621. (No model.)

To all whom it may concern:

Be it known that I, WALTER D. DAVIES, a citizen of the United States, residing in the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Watches, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to watches of cheap and strong construction, which can be very cheaply produced by such machinery as is used in the manufacture of clocks.

The object of the invention is to provide for the use of a very long and strong mainspring, and to provide for such spring a cheap and strong stem-winding mechanism with which is combined a simple mechanism for setting the hands; and the improvement consists in certain novel combinations, hereinafter described and claimed, of the parts of a watch whereby these results are obtained.

The accompanying drawings represent as much of a watch-movement as is necessary to illustrate my invention, all parts not necessary for such illustration being omitted.

Figure 1 is a front view with the dial and hands omitted. Fig. 2 represents a central section of the same in the line *xx* of Fig. 1. Fig. 3 is a back view of the same with the cap of the mainspring-barrel omitted. Fig. 4 is a sectional view taken in a plane immediately below and parallel with the front plate. Fig. 5 represents a section taken in the line *yy*, Fig. 1, of the two movement-plates and part of the stem-winding mechanism. Fig. 6 is a top view of part of one of the plates of the movement.

Similar letters of reference indicate corresponding parts in the several figures.

A designates the front plate, and B the back plate, held together by posts *a* and screws *b*. C is the dial.

D is a central spindle fitted to turn freely in bearings in the centers of the plates, and having fast upon it the main wheels *e e'*, which occupy positions close together directly in the center of the watch and near the back of the front plate, A, the wheel *e* being intended to drive the escapement-train, and the wheel *e'* being intended to drive the hands.

E is the mainspring-barrel, arranged outside

of the back plate, B, and centrally thereto. This is represented in Figs. 2 and 3 of an internal diameter nearly equal to two-thirds the diameter of the movement-plates. The said barrel has provided around it, close to the plate B, teeth *d*, which gear directly with the winding-wheel *e* on the stem-spindle *f*, as will be hereinafter more particularly described. The said barrel is fitted loosely to the center spindle, and is held in place close to the back plate, B, simply by means of a shoulder, *g'*, on the said spindle within the said plate, and a collar, *g*, which is fastened to the said spindle within the barrel and to which the inner end of the mainspring F is secured, the outer end of the latter being secured to the inner periphery of the barrel E.

The wheel *e'* on the central main spindle, D, gears with a wheel, *h*, arranged between the plates A B on a spindle, *i*, which works in bearings in the plates A B, and which carries outside of the front plate, A, the minute-wheel *j* and the minute-wheel pinion *k*. The cannon-pinion *l*, which gears with the minute-wheel *j*, is loose on the center spindle, D, and it has a hub, *n*, on which turns loosely the hour-wheel *m*. On the hub *n* of the cannon-pinion is a projection, *n'*, to receive the minute-hand, and on the hour-wheel is a projection, *m'*, as usual, to receive the hour-hand.

The wheel *e* for driving the escapement-train gears with a pinion, *o*, on a spindle, *p*, working in bearings in the plates A B, and this spindle carries a wheel, *q*, which gears with the escapement-train, and as this train forms no part of the present invention I have not thought it necessary to represent or describe it.

It may be here remarked that a single wheel might be substituted for *e* and *e'* to drive both the hands and the escapement-train.

The winding-pinion *e*, the periphery of which projects through an opening, *e'*, in the back plate, B, is fitted loosely to the stem-spindle, *f*, and it is provided with a hub, *f'*, which projects on either side in such manner as to form two journals, which fit to bearings in two plates, *r*, which stand perpendicular to the plates A B, and are secured firmly between the latter. The said pinion *e*, therefore, constitutes the bearing for the stem-spindle *f*,

in which the said spindle may both turn freely and slide longitudinally. The inner end of the hub f' of the winding-pinion is notched to form one member of a contrate ratchet-clutch, t , the other member of which is fast to the winding-spindle. A spiral spring, t' , coiled around the said spindle between the said clutch and a fixed post, s , secured to the back plate, B, serves to press the inner member of the said clutch against the outer one, and thereby to keep the pinion in gear with the spindle when the spindle is not purposely pushed inward by outside pressure upon its head. The stem-spindle carries, also, the hand-setting pinion, u , which is fast upon it, and the periphery of which passes through an opening, u' , in the front plate, A, the said opening being wide enough to allow the said pinion to pass into gear with and out of gear from a toothed wheel, v , which is arranged in a suitable position loosely on a fixed stud, v' , fast on the front plate, and which is always in gear with the dial-work through the minute-wheel j , with which it directly engages. The tendency of the pressure of the spring t' is to throw the setting-pinion u out of gear from v while it holds the clutch of the winding-pinion e in gear.

To wind the watch, the stem-spindle is turned in the proper direction without being pressed inward, and the pinion e , being then in gear with the spindle by the contrate ratchet-clutch, operates on the teeth d of the barrel, and so turns the latter and winds up the mainspring from the outer end, the winding being retained by a spring-pawl, G, attached to the plate B and engaging between the teeth d of the barrel.

To set the hands, the stem-spindle is first pushed in to bring the pinion u into gear with the wheel v and bring the clutch t and the winding-pinion out of gear from the said spindle, when the hands may be turned in either direction by the said spindle. To permit this the wheel h is fitted friction-tight to the spindle i , that the said wheel may remain independent of the said spindle while the latter turns with the wheel j and pinion k .

A feature of some importance in the stem-winding mechanism is the manner of applying the plates r , which contain the bearings for the journals constituted by the hub f' of the winding-pinion. These two plates are formed with square tongues r' at their four corners, two of the said tongues projecting upward and two downward, as shown best in Fig. 5, but all being flush with the faces of their respective plate. The upper and lower portions of these plates between their tongues are parallel and at a distance apart equal to that of the plates A B, and the length of the tongues is about equal to the thickness of the latter plates. A single opening, e' , the form of which is shown best in Fig. 6, is provided in each of the plates A B to receive the two plates $r r$ and to allow the passage of the winding-pinion e . The said opening is of a length equal to the whole length of the plates $r r$; but the middle or

greater portion of it is only as wide as the thickness of the body of the pinion e between the projections or journals of its hub, while the end portions of its sides are widened to form recesses $e^* e^*$, Fig. 6, to receive the tongues $r' r'$ on the plates $r r$. The plates $r r$ and the openings $e' e'$ being thus constructed, and the pinion being so adapted to the plates, the said plates serve to hold the pinion properly in place, while the body of the pinion keeps the said plates properly separated, so that their tongues $r' r'$ are prevented from moving out of the recesses $e^* e^*$, and the plates are thus held in place by the pinion without any riveting, screwing, clinching, or other fastening.

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

1. The combination, in a watch, of the mainspring and a barrel therefor having teeth on its periphery for winding, and applied outside of the back plate and concentric therewith, and a central spindle turning in a bearing in the center of said plate and carrying the wheel for driving the movement, and having the inner end of the mainspring connected with it, substantially as herein described.

2. The combination, with the spring-barrel and the stem-spindle of a watch and a winding-pinion gearing directly with teeth on the barrel, and in which the said spindle is capable both of turning and moving longitudinally, of fixed bearings for said pinion in which it may rotate, but by which it is always kept in gear with the teeth on the barrel, a contrate clutch, one member of which is upon the said wheel and the other fast upon said spindle, and a spring for keeping the said clutch in gear, substantially as herein described.

3. The combination, in a watch, of a stem-spindle and a pinion fast on said spindle for setting the hands, a winding-pinion in which said spindle is free both to turn and to move lengthwise, and which is itself free to turn, but incapable of moving in an axial direction, a contrate ratchet-clutch, one member of which is fast on the winding-pinion and the other fast on the spindle in such position that when it is in gear with the other member the setting-pinion is out of gear from the dial work, and vice versa, and a spring applied to said spindle to hold the clutch in gear and hold the setting-pinion out of gear, all substantially as herein described.

4. The combination, with the front and back plates of the watch having openings e' , with recesses $e^* e^*$, of the plates r , constituting journal-bearings and having tongues $r' r'$ to enter said recesses, and a winding-pinion, the body of which occupies the space between the said plates r , and which has journals received in said bearings, all substantially as and for the purpose herein set forth.

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