

Edward Howard.
Stem Winding Watch.

PATENTED
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Fig. 1.

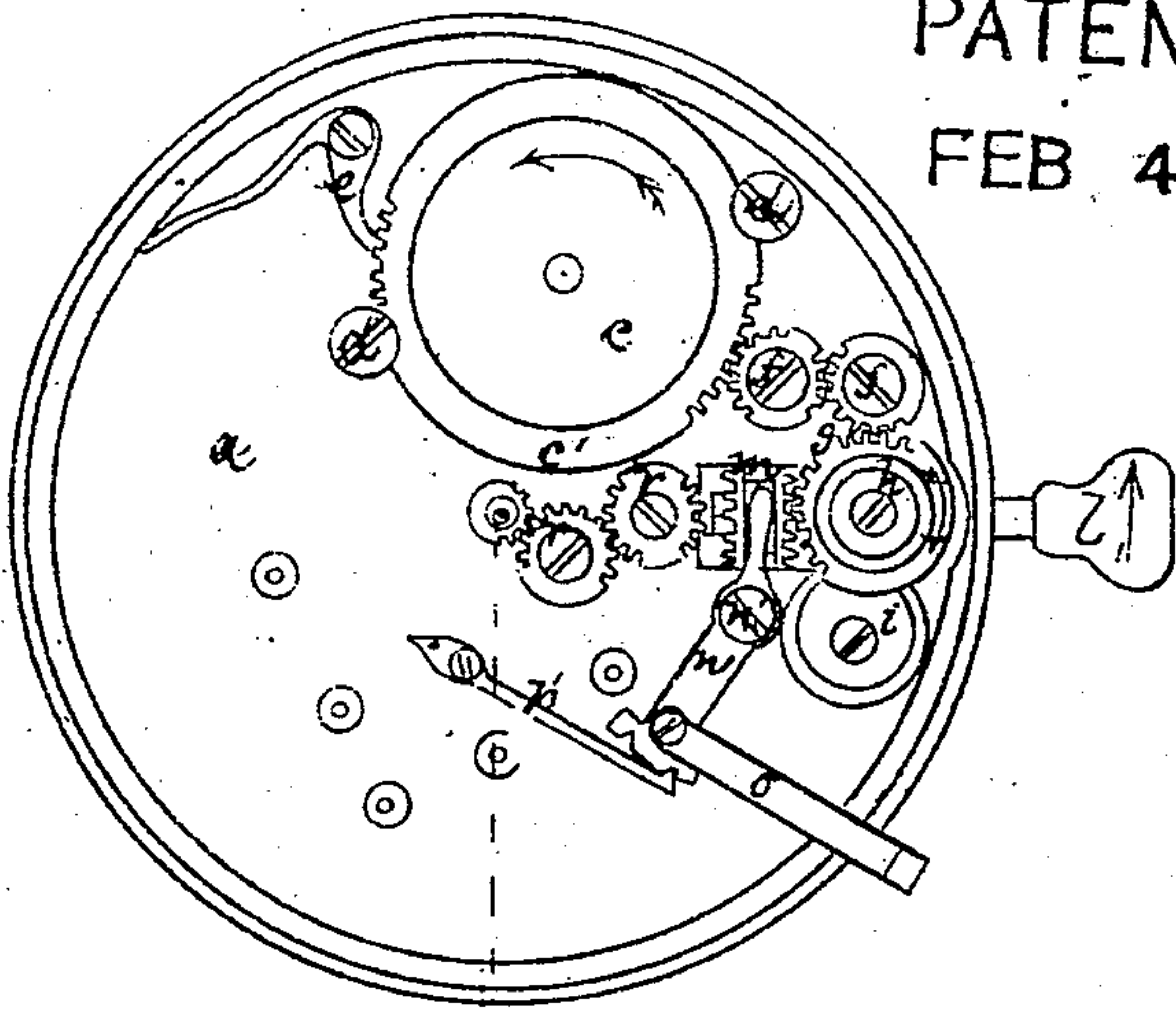


Fig. 2.

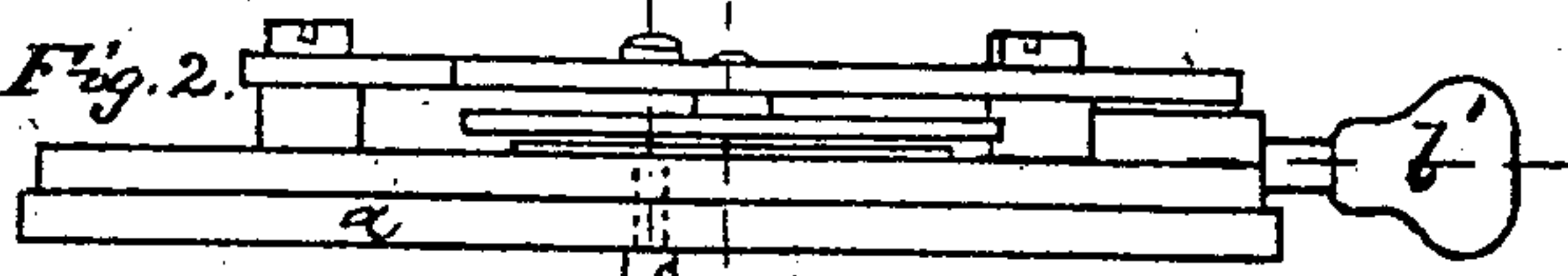


Fig. 4.

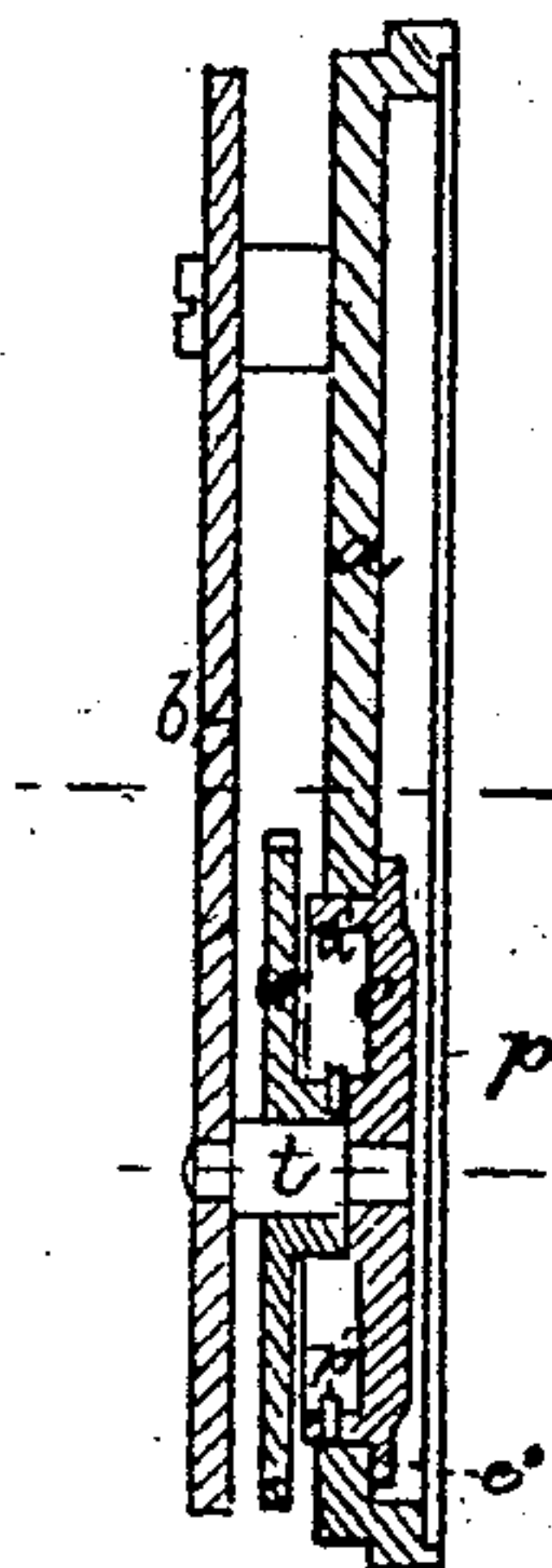


Fig. 3.

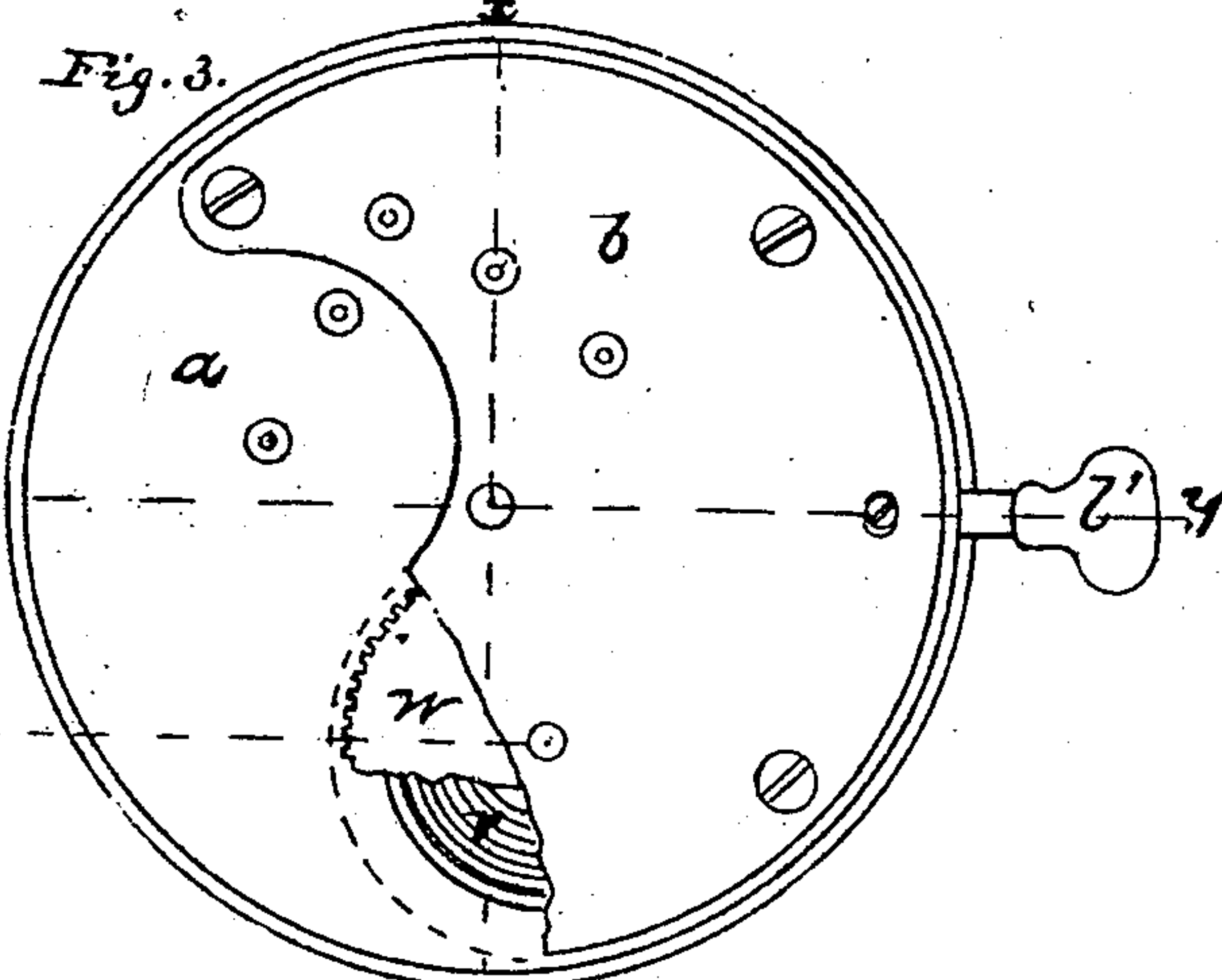


Fig. 5.

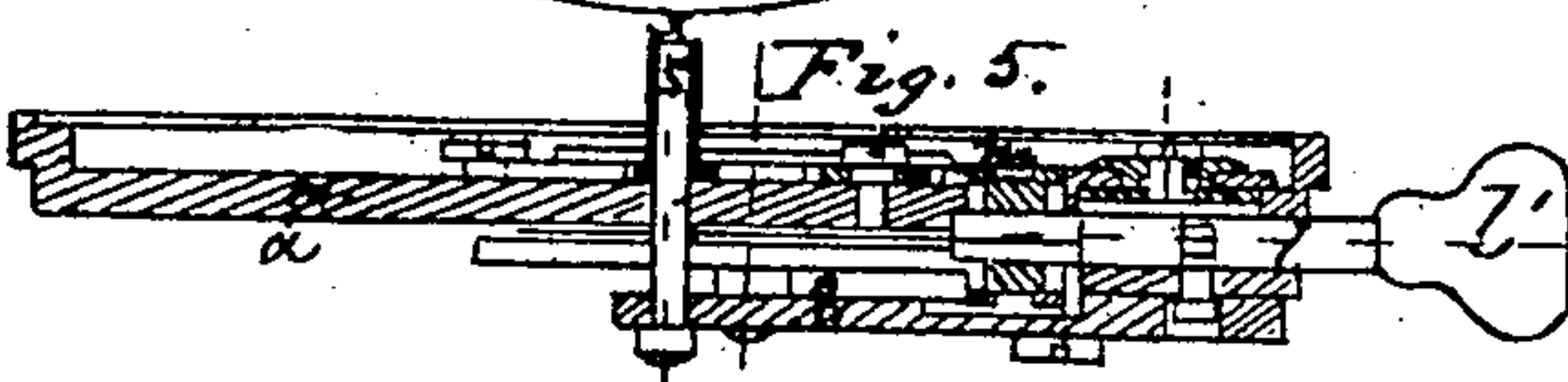


Fig. 6.

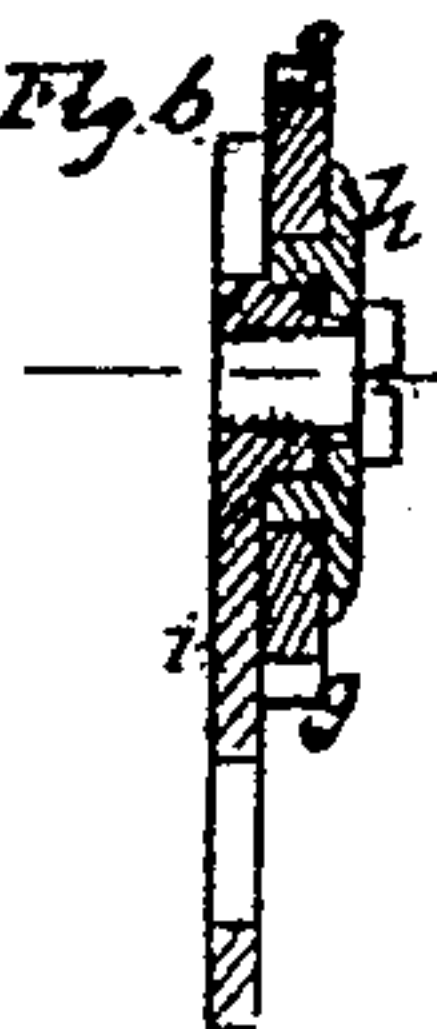


Fig. 7.

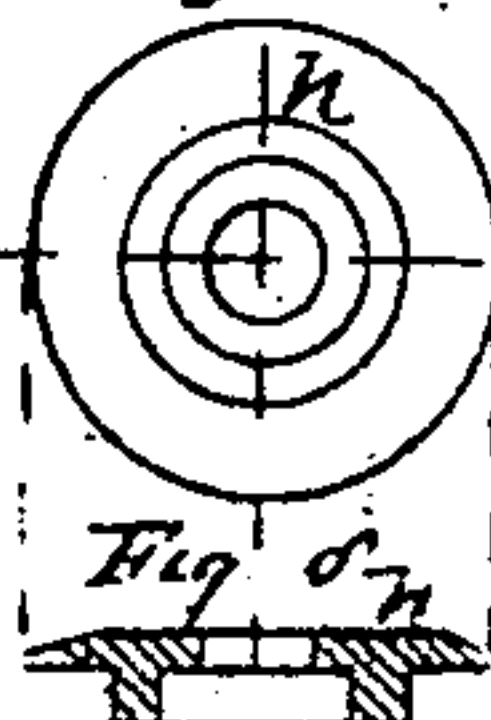


Fig. 9.

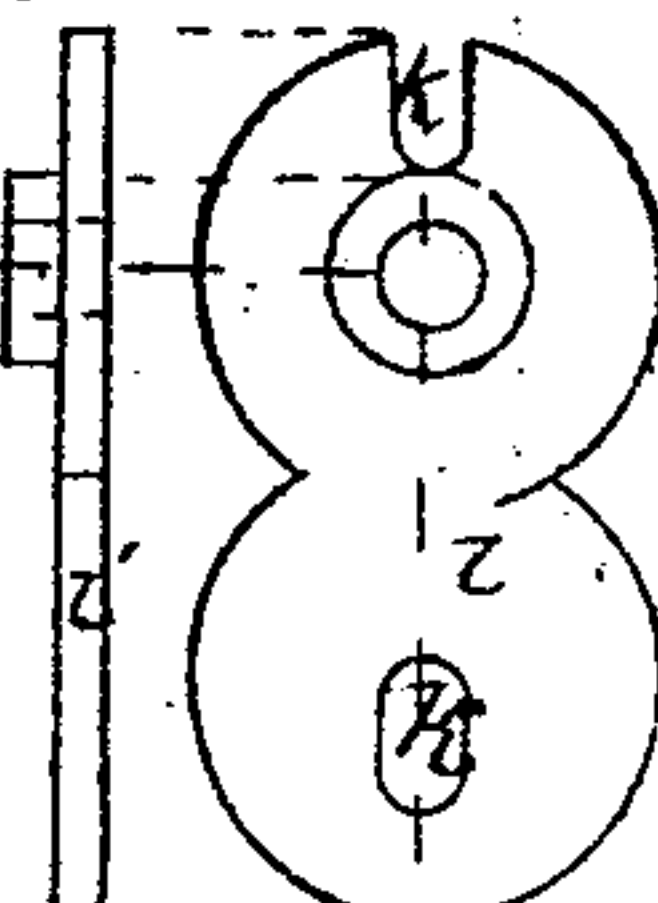
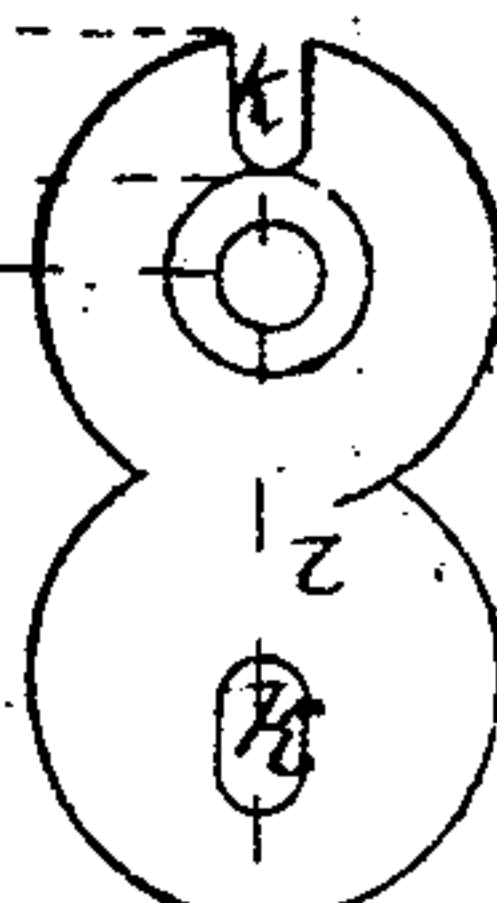


Fig. 10.



J. H. Adams
Chas. S. G. Wicks } Witnesses

Inventor
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*The drawing in this patent
is not in print.*

United States Patent Office.

EDWARD HOWARD, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 74,090, dated February 4, 1868.

IMPROVEMENT IN STEM-WINDING WATCHES.

The Schedule referred to in these Letters Patent and making part of the same.

Be it known that I, EDWARD HOWARD, of Boston, in the county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Stem-Winding Watches, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a plan view of the winding and setting-mechanism.

Figure 2 is an edge view of the watch-frame.

Figure 3 is a view of the under side, with a portion of the under plate broken away, to show the position of the main-spring, barrel, and the main wheel.

Figure 4 is a section of the same on the line *xx* of fig. 3; and

Figure 5 is also a section on the line *yy* of fig. 3.

Figures 6 to 10 are detail views of various parts of the mechanism.

Similar letters indicate like parts in the several figures.

The object of my invention is to provide against injury to the train in the event of the breaking of the main-spring in stem-winding watches; also, to simplify the construction of the working parts of watches of this description, and, at the same time, render them more durable; and the invention consists in fitting the spring-box or barrel in an opening in the dial-plate, so as to allow the former to rotate freely when the spring is wound up, the said box or barrel being provided with, and supported in the plate by, a toothed flange, resting on the dial-plate, and confined to the same by means of screw-heads or projections on the plate, so as to allow the spring with its barrel to be wound up, and, by means of a spring-pawl engaging in the toothed flange, the barrel is prevented from turning in the opposite direction when the watch is running down.

The invention also consists of a sliding plate, which is secured to the dial-plate by means of screws passing through slots in the same, in combination with a button or washer and a toothed wheel, in such a manner that, by turning the arbor or key that passes through the stem of the case in one direction, the said toothed wheel will be advanced to a position to engage with an intermediate gear, and thus wind up the main-spring barrel, and, by turning the arbor or key in the opposite direction, the slide will again recede, and disengage the toothed wheel from the said intermediate gear, and thus allow the arbor to be rotated in the opposite direction without the necessity of releasing the hold on the stem in the act of winding up the watch.

The invention also consists in the peculiar method of transferring the action of the arbor or key from the winding-mechanism to that for setting the hands.

Referring to the drawings, *a* represents the dial-plate, and *b* the under segmental plate. *c* is the barrel, formed with a rim or annular projection, *a'*, that fits within an opening in the dial-plate, and so as to rotate freely therein. The periphery of the upper plate of the barrel forms a toothed flange, *c'*, which rests or bears upon the dial-plate, as shown in fig. 4, and is confined to the same by means of screw-heads *d* or other equivalent means. A spring-pawl or click, *e*, is arranged to engage in the toothed flange, in order to prevent the barrel from turning in the direction opposite to that for winding up the watch. The main-spring *r* is attached, at one end, to the hub of the main-wheel arbor by means of a pin, *p*, as shown in fig. 4, and at the other end to a pin or projection on the inner side of the rim of the barrel *c*, as shown at *p'*, so that the main wheel and arbor will be actuated by the spring, and the barrel will be prevented from rotating, by means of the spring-pawl or click *e*. The main wheel *w* is firmly attached to the arbor *t*, one end of which latter has its bearing in the spring-barrel, and the other end in the lower plate *b*. *f f'* represent small gears connecting the flange *c'* of the drum with the toothed wheel *g*. The wheel *g* is attached to a sliding plate, *i*, which is shown as somewhat enlarged in figs. 6, 9, and 10, and has a rotating movement upon the same. The plate *i* is formed as shown in figs. 9 and 10. It is arranged within a recess in the dial-plate, and is allowed to slide within the said recess, to a certain extent, longitudinally, being confined to the dial-plate by means of set-screws or projections passing through slots *k k'*, at its rear and front ends, so as to prevent any lateral movement. Attached to the sliding plate *i* is a button or washer, *h*, placed over the wheel *g*, and connected with the plate *i* in such a manner as to allow the wheel *g* to rotate freely on an axis which forms the connection between the said button and the sliding plate. The plate *i* may be made stationary, and the wheel *g* kept in constant contact with the gear *f'*, in which case it;

would be necessary to release the hold on the handle *l'*, to continue the operation of winding up the spring-barrel. *l*, fig. 5, represents the arbor or key which winds up the watch. It is provided with a thumb-piece, *l'*, by which it is turned. Its inner portion is made square, and on this square portion, in an opening in the plate *a*, is fitted, so as to slide freely, a double crown-wheel, *m*, having a groove or recess formed on the centre of its periphery. In this groove or recess fits one arm of the lever *n*, which lever is pivoted or fulcrumed to the plate *a*, at *n'*. To the other arm of the said lever, near its end, is pivoted a bar, *o*, which extends to the outer edge of the case, so that it can be easily moved in and out when the cover is open, and thus change the position of the double crown-wheel *m*, on the arbor or key *l*, as desired. The lever *n* is held in either position, at the limit of its motion, by means of a spring, *p'*, whose pointed end fits within a notch in a cross-head of the lever *n*, as clearly shown in fig. 1. *r r* represent the gears connecting the crown-wheel *m* with the mechanism that actuates the hands.

The operation is as follows: When it is desired to wind up the watch, the handle, *l'*, of the key or arbor is turned in the direction shown by the arrow. The sliding plate *i* is then carried forward, by the friction of the button *h* and the action of the crown-wheel *m* on the gear *g*, causing the latter to engage with the gear *f'*, and thus communicate motion to the drum *c*, in the direction of the arrow. Without releasing the hold upon the stem or handle *l'*, and turning the same in the opposite direction, the sliding plate is retracted, and the gear *g* is disconnected from the wheel *f*, thus allowing the gear *g* to turn freely. The next reverse movement of the handle *l'* again advances the gear *g* to the wheel *f'*, and so the operation of connecting and disconnecting the gears is freely and successively performed, until the spring-barrel is wound up.

When it is desired to set the hands, the cover of the case is opened, and the arm *o* is drawn out, which operates the lever *n*, and thus moves the crown-wheel, disengaging it from the gear *g*, and causing it to engage with the wheel *r*, and thus communicate motion to the hands in either direction, as required, and when the hands are properly set, the rod *o* is again pushed into its place, restoring the crown-wheel to its position, in contact with the wheel *g*. The outer end of the arm *o* is bevelled, and arranged in such a position, relatively with the cover of the case, that, in closing the latter, it will force the arm *o* in, and thus disengage the crown-wheel from the contact with the wheel *r*, communicating with the hands, and restore it to a position, in contact with the gear *g*, for winding up the spring.

By thus constructing stem-winding watches, I am enabled to secure compactness in the mechanism and avoid the necessity of increasing the thickness of the watch, and render them less liable to get out of order, and also to prevent injury to the train, occasioned by the breaking of the main-spring. In case the main-spring should break in the watch constructed after my improvement, the reaction is confined to the spring-barrel, and entirely disconnected from the train.

I do not claim a spring-barrel, which is revolved when the watch is being wound up, and which remains stationary when the watch is running down, that being an old device; but, having thus described my invention, What I claim as new, and desire to secure by Letters Patent, is—

1. Applying the winding-mechanism directly to the barrel which contains the spring, in the manner and for the purpose substantially as described.
2. I claim the sliding plate *i*, in combination with the spur-wheel *g* and button or washer *h*, as and for the purpose set forth.
3. I claim, in combination with the arbor or key *l*, provided with a movable double crown-wheel *m*, the spur-wheel *g*, sliding plate *i*, and button *h*, as specified.
4. I claim the barrel *c*, constructed as described, and arranged within an opening in the plate *a*, in combination with the main wheel *w*, spring *v*, and pawl *e*, substantially as and for the purpose specified.
5. I claim the spring-barrel, formed with the plate *c*, the rim or annular projection *a'*, and the toothed flange *c'*, as and for the purpose set forth.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD HOWARD.

Witnesses:

J. H. ADAMS,
M. S. G. WILDE.