

A. FRANKFELD.

Double Stop-Movements for Watches.

No. 143,619.

Patented Oct. 14, 1873.

Fig. 1.

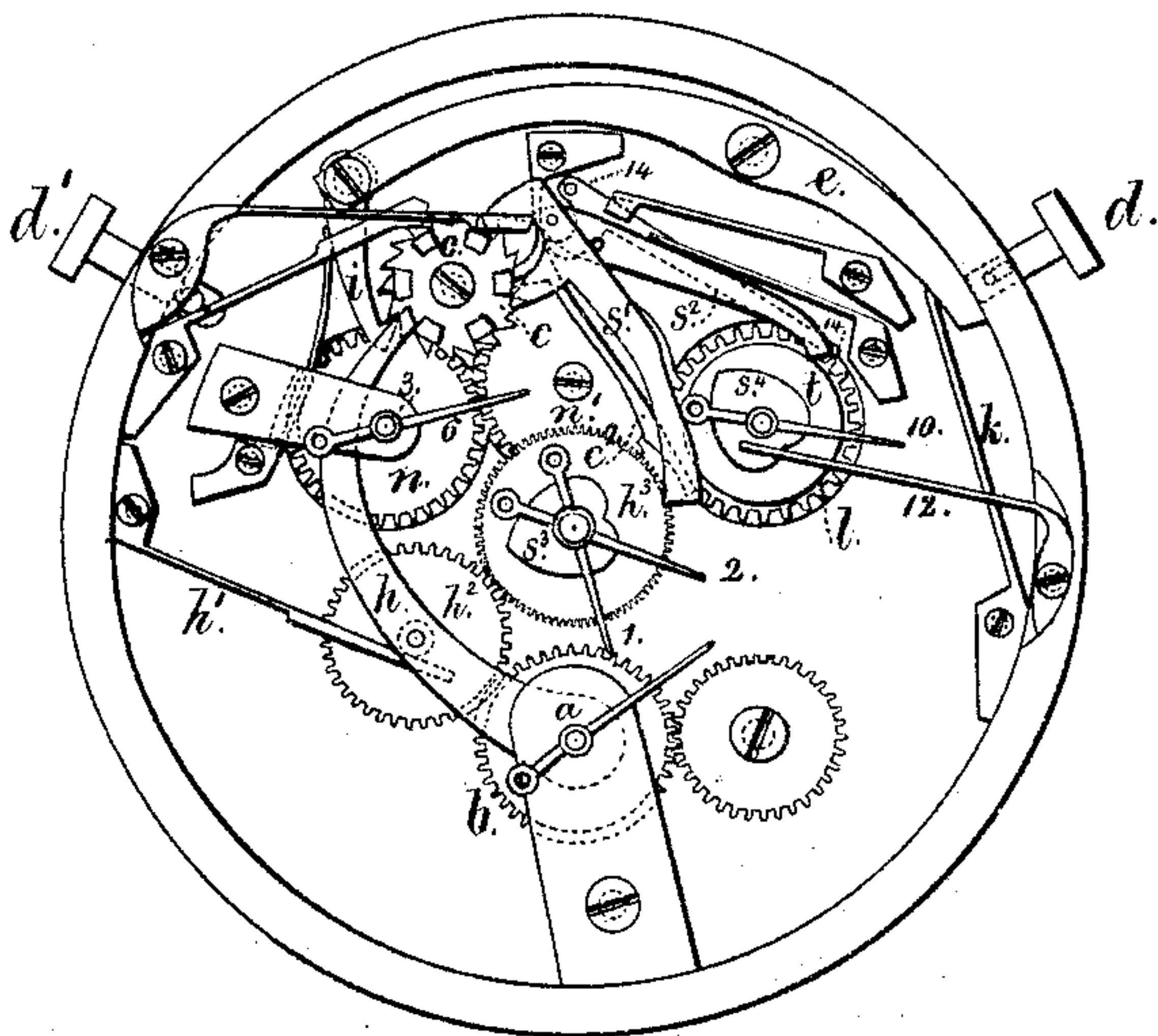
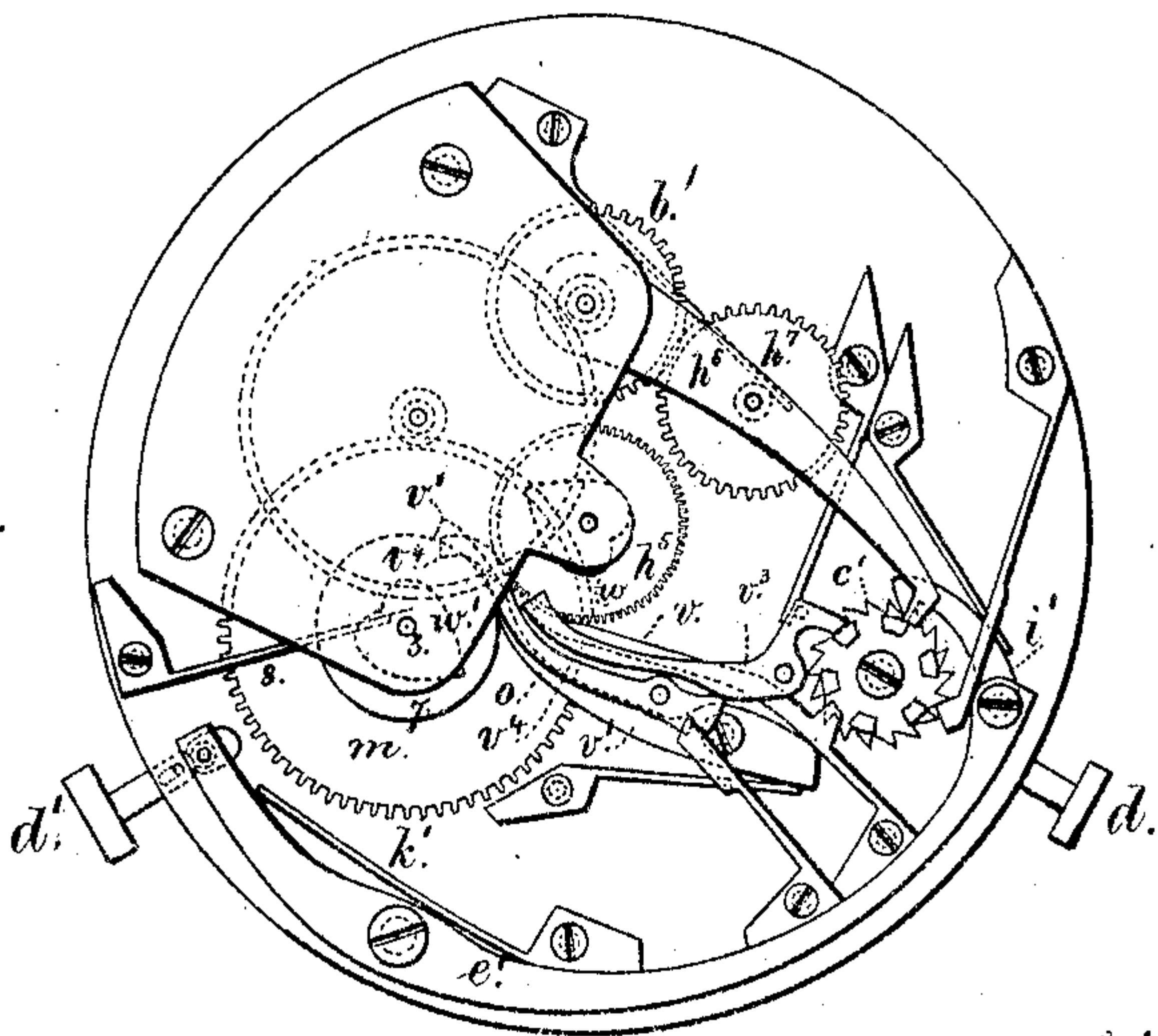


Fig. 2.



Witnesses,

Charles Smith
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN DOUBLE-STOP MOVEMENTS FOR WATCHES.

Specification forming part of Letters Patent No. **143,619**, dated October 14, 1873; application filed April 28, 1873.

To all whom it may concern:

Be it known that I, ARNOLD FRANKFELD, of the city and State of New York, have invented an Improvement in Double-Stop Movements for Watches, of which the following is a specification:

Before my invention watches had been made with what is known in the trade as chronograph movements, consisting of two trains of gearing, and with independent second and minute hands that are brought into action by one movement of the push-pin, stopped by the next movement of the push-pin, and returned to the XII of the dial by the third push of the pin; but where the two trains of wheels and main-springs are employed it is generally detrimental to the time-keeping qualities of the watch, as making the time-keeping portion and balance too crowded. Besides this there is difficulty in noting two or more successive observations.

My improvement provides for a time-keeper of usual character, with second, minute, and hour hands, and also for two independent second and minute hands connected with them, and the parts are constructed and connected in such a manner that one of the second and minute hands can be started by pushing in a pin. They can be stopped or simultaneously returned to the 60 of the dial, and while one observation is being taken, or immediately thereafter, a second observation can be commenced by operating a second push-pin to start the other pair of hands, and they can be stopped by a second push of the same pin, and afterward returned to the 60, or starting-point, by a third push of the pin. By this construction two distinct observations can be taken, and record kept either successively or during the same interval, because each pair of hands, composed of a second and minute hand, is started, stopped, or returned to XII, independently of the other pair of hands, and independently of the ordinary hands of the watch, which continue their movement.

In the drawing, Figure 1 is a view of the watch-plate with the chronograph mechanism on one side thereof; and Fig. 2 is the reverse side of such plate.

The ordinary portion of the watch-movement is not shown, except the second hand *a* and its

wheels *b b'*, that are connected in the usual train of wheels. Upon the plate *a* are two ratchet and cam wheels, *c* and *c'*. They are on opposite sides, and they are moved around progressively by the push-pins *d d'*, levers *e e'*, pawls *i i'*, and the lever-springs *k k'* are provided to bring the levers to the normal positions and project the push-pins. Each of the ratchet and cam wheels is made to perform three duties and then repeat them; but as this has before been done in stop-watches, or independent second watches, I proceed to describe my improvement.

The hands 1 and 2 are to indicate seconds and parts of seconds, according to the number of pulsations of the balance in a second. These hands will usually be long enough to indicate by the divisions around the edge of the dial. They are represented as short hands for convenience, and being in the center of the dial they will be above the ordinary hour and minute hands that are upon tubular arbors. The wheel *b'* on the arbor of the second-hand *a* gears to the wheel *m* through an intermediate, so as to revolve the said wheel *m* once an hour, and by the gearing *n n'* the wheel *l* is revolved in the same time. The arbor 3 of the wheels *m n* is loose in such wheels, and carries the minute-hand 6, and upon this arbor is a disk, 7, forming a brake-wheel, and *o* is the brake to stop the same; but when this brake is not in contact with the disk 7, the spring 8 produces sufficient friction to cause the minute-hand 6 to revolve. The hand 10, arbor, and disk *t*, are connected together and moved by the wheel *l*, the spring 12 giving the necessary friction, while the brake 14 is drawn back from said disk; the wheel *l* continues to revolve, but does not move the disk *t* or hand when the brake 14 is in contact with *t*.

The operations are as follows: When the push-pin *d* is operated the lever *h* is moved by the spring *h¹*, and the wheel *h²* thrown into gear with the wheel *h³*, so that the second-hand 1 commences to move at the same time the cam-wheel *c* pushes the brake *e²* from contact with the said wheel *h³*, and the brake 14 to the disk *t* is simultaneously operated, so that the disk *t* and minute-hand 10 start at the same time as the hand 1. A second push of the pin *d* turns the cam-wheel *c* another tooth, and

applies the brakes c^2 and 14 to stop the wheel h^3 and disk t , and a third push of the pin d turns the cam-wheel c to allow the levers s^1 and s^2 to act through their respective springs upon the heart-cams s^3 and s^4 , and return the hands 1 10 to the 60, or starting points, the brakes c^2 and 14 being first relieved from their respective wheels. The operations of the parts shown in Fig. 2, in connection with the hands 6 and 2, is substantially the same as before described. The brakes v and v^1 act with the wheel h^5 and disk 7, the lever h^6 brings the wheel h^7 into and out of gear with the wheel h^5 of the hand 2, and the levers v^3 and v^4 act upon the heart-cams w w' to return the hands to 60. The wheel h^3 , cam s^3 , and hand 1, are connected to a sleeve upon the arbor to which the wheel h^5 , cam w , and hand 2 are secured.

By this construction either chronograph can be brought into action, stopped, or returned to the point of beginning without reference to the other.

The hands for this double-stop movement may be over the ordinary face, the proper dials being provided for them, or there may be a special dial at the back of the watch for these two pairs of minute and second hands, so that the observations may be made at one side of the watch, and the ordinary time be indicated at the other side.

I claim as my invention—

The second-hands 1 and 2, connected, respectively, with the minute-hands 10 and 6, in combination with the double-stop mechanisms and their respective push-pins, substantially as and for the purposes set forth.

Signed by me this 22d day of April, A. D. 1873.

A. FRANKFELD.

Witnesses:

GEO. T. PINCKNEY,
CHAS. H. SMITH.