P. M. DORET.

Minute-Counting Attachment for Chronographs.

No. 223,220. Patented Jan. 6, 1880.

Fig. 1

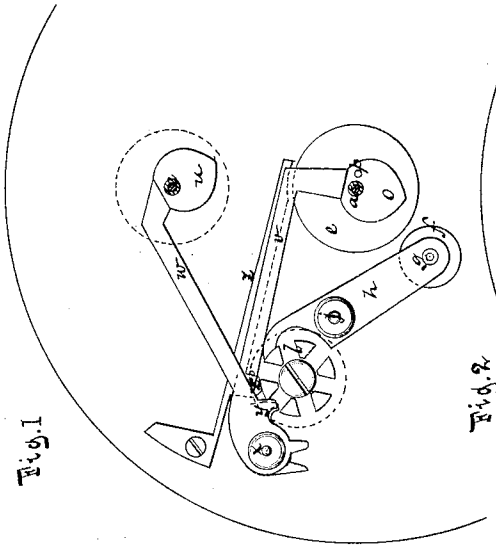


Fig. 2

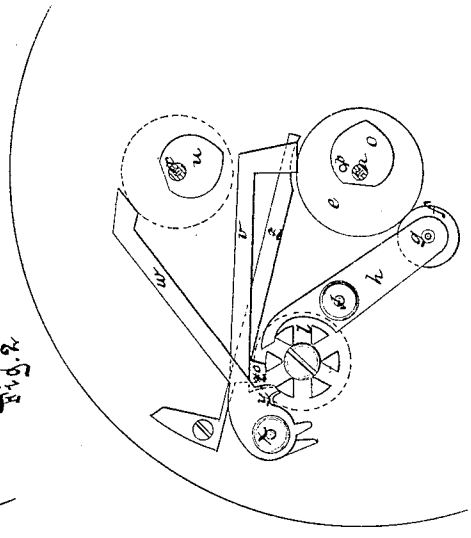
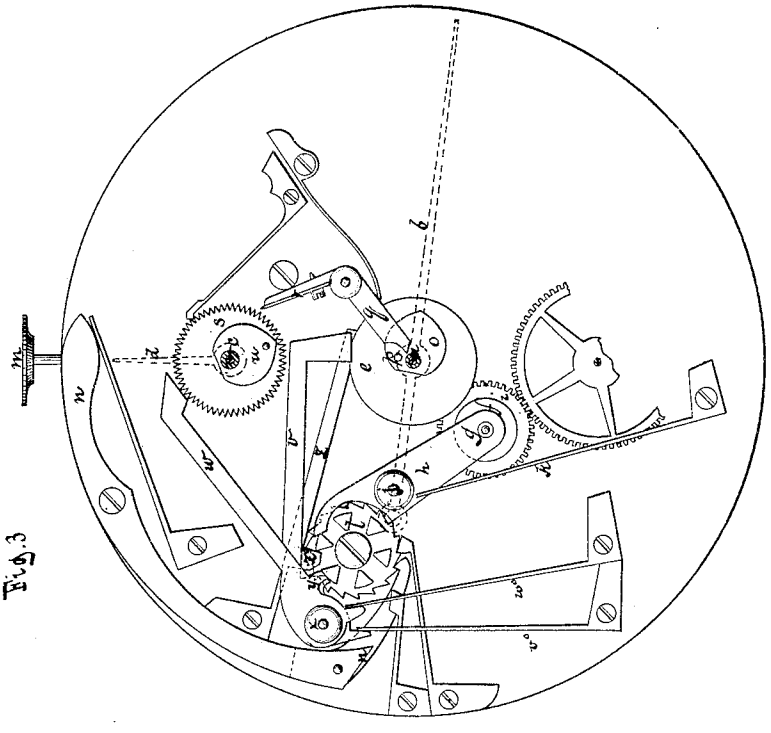


Fig. 3



Witnesses.

Otto Stufeland

William Meller.

Inventor.

Paul Matthey Doret

by

Van Santvoord & Hauff

his attorneys.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

PAUL MATTHEY DORET, OF LOCLE, SWITZERLAND.

MINUTE-COUNTING ATTACHMENT FOR CHRONOGRAPHS.

SPECIFICATION forming part of Letters Patent No. 223,220, dated January 6, 1880.

Application filed April 9, 1879.

To all whom it may concern:

Be it known that I, PAUL MATTHEY DORET, of Locle, in the Republic of Switzerland, have invented a new and useful Improvement in Minute-Counting Attachments for Chronographs, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a face view of the working parts of my chronograph when the same is standing still at zero. Fig. 2 shows a similar view when the chronograph is thrown in gear with the watch-movement. Fig. 3 is a similar view when the chronograph has been stopped and before its index-hands have been returned to zero.

Similar letters indicate corresponding parts.

This invention relates to chronograph attachments for watches, in which are employed an independent second-hand, a minute-hand, mechanism for propelling the minute-hand one step at each complete revolution of the second-hand, and mechanism for simultaneously returning the second and minute hands to zero when desired.

My improvement consists in a second-hand arbor and a minute-hand arbor, situated at a distance from each other, the arbor of the former having a cam-disk provided with a laterally-projecting stud or pin, which is adapted to operate on one end of a bell-crank lever, the other end of the latter when so operated engaging a ratchet-wheel on the arbor of the minute-hand, thereby moving the same one step at each complete revolution of the cam-disk on the second-hand arbor, all of which will be fully hereinafter described.

In the drawings, the letter *a* designates the arbor which carries the second-hand *b*, and the letter *c* the arbor which carries the minute-hand *d*, Fig. 3. On the second-hand arbor *a* is mounted a milled disk, *e*, to which a revolving motion can be imparted by another milled disk, *f*, mounted on a spindle, *g*, which has its bearing in the shipping-lever *h*, and on which is mounted a cog-wheel, *i*, that is geared together with the watch-movement, as indicated in Fig. 3.

The shipping-lever *h* swings on a pivot, *j*, and it is subjected to the action of a spring, *k*, which has a tendency to force the disk *f* against the disk *e*. One end of said shipping-lever engages with a trip-wheel, *l*, to which a step-by-step motion can be imparted by means of a button, *m*, secured to a pin which extends from a lever-pawl, *n*, through the side of the watch-case, said trip-wheel being provided on its circumference with ratchet-teeth, with which the lower pawl engages.

When one of the projections of the trip-wheel bears against the end of the shipping-lever, as shown in Figs. 1 and 3, the disk *f* is held out of gear with the disk *e*, and the motion of the second-hand arbor stops; but if one of the spaces of the trip-wheel comes opposite the end of the shipping-lever (see Fig. 2) the disk *f* is thrown in contact with the disk *e*, and motion is imparted to the second-hand arbor from the watch-movement.

On the second-hand arbor is mounted a cam-disk, *o*, in the face of which is secured a pin, *p*, which acts on the arm *q* of a bell-crank lever, *q r*, so that for each revolution of the arbor *a* the arm *r* of said bell-crank lever is caused to act on a ratchet-wheel, *s*, which is mounted on the minute-arbor *c*. On this arbor is mounted a cam-disk, *u*.

The cam-disks *o* and *u* are for the purpose of returning the second-hand and the minute-hand to zero by the action of two levers, *v* and *w*, respectively. Both these levers are mounted on a common pivot, *x*, and they are exposed to the action of springs v^0 w^0, respectively, which have a tendency to force them inward against the cam-disks *o* and *u*. Each of the levers is provided with a spur, *y*, which is acted upon by the trip-wheel *l*. When these spurs *y* are opposite to a space in the trip-wheel (see Fig. 1) the levers *v* and *w* fly inward and cause the cam-disks *o u* to turn so that the edges of said levers bear against the flat spaces on the cam-disks, and both the second and minute hands are thrown to zero.

A brake, *z*, serves to stop the motion of the disk *e* and second-hand arbor *a* as soon as the disk *f* is thrown out of contact with the disk *e*. This brake consists of a spring-lever provided with a spur, z^0, which is acted upon by the trip-wheel *l*, and it bears upon the edge of the disk *e* when the button *m* is pressed in after the chronograph-movement has been in motion.

When the chronograph-movement is at rest,

Fig. 1, and the button *n* is pressed in, the disk is thrown in contact with the disk *e*, the brake *z* and the levers *v w* being held in the position shown in Fig. 2; and if the button is again pressed in, the disk *f* is thrown back and the brake *z* is applied to the disk *e*, (see Fig. 3,) and the chronograph-movement is stopped without interfering with the ordinary watch-movement. If, then, the button *m* is again pressed in, the levers *v w* act on the cams *o u*, and the hands *b d* are returned to zero, leaving the chronograph mechanism in the position shown in Fig. 1.

By this arrangement any desired period of time (within certain limits) can be readily registered without any attention to the chronograph-movement.

I do not claim as my invention the mechanism herein described as applied to the second-hand, such being not new.

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

The combination of the disconnected and independent second and minute hand arbors, the former having a cam-disk provided with a laterally-projecting stud or pin, and the latter carrying a ratchet-wheel, with a pivoted bell-crank lever having one end adapted to be operated by said pin or stud, and the other end adapted to engage with and move the ratchet-wheel on the minute-hand arbor one step at each complete revolution of the second-hand arbor, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 31st day of January, 1879.

PAUL MATTHEY DORET. [L. S.]

Witnesses:

LS. GVE. PERRELET,

P. E. JACOT.