

(No Model.)

2 Sheets—Sheet 1.

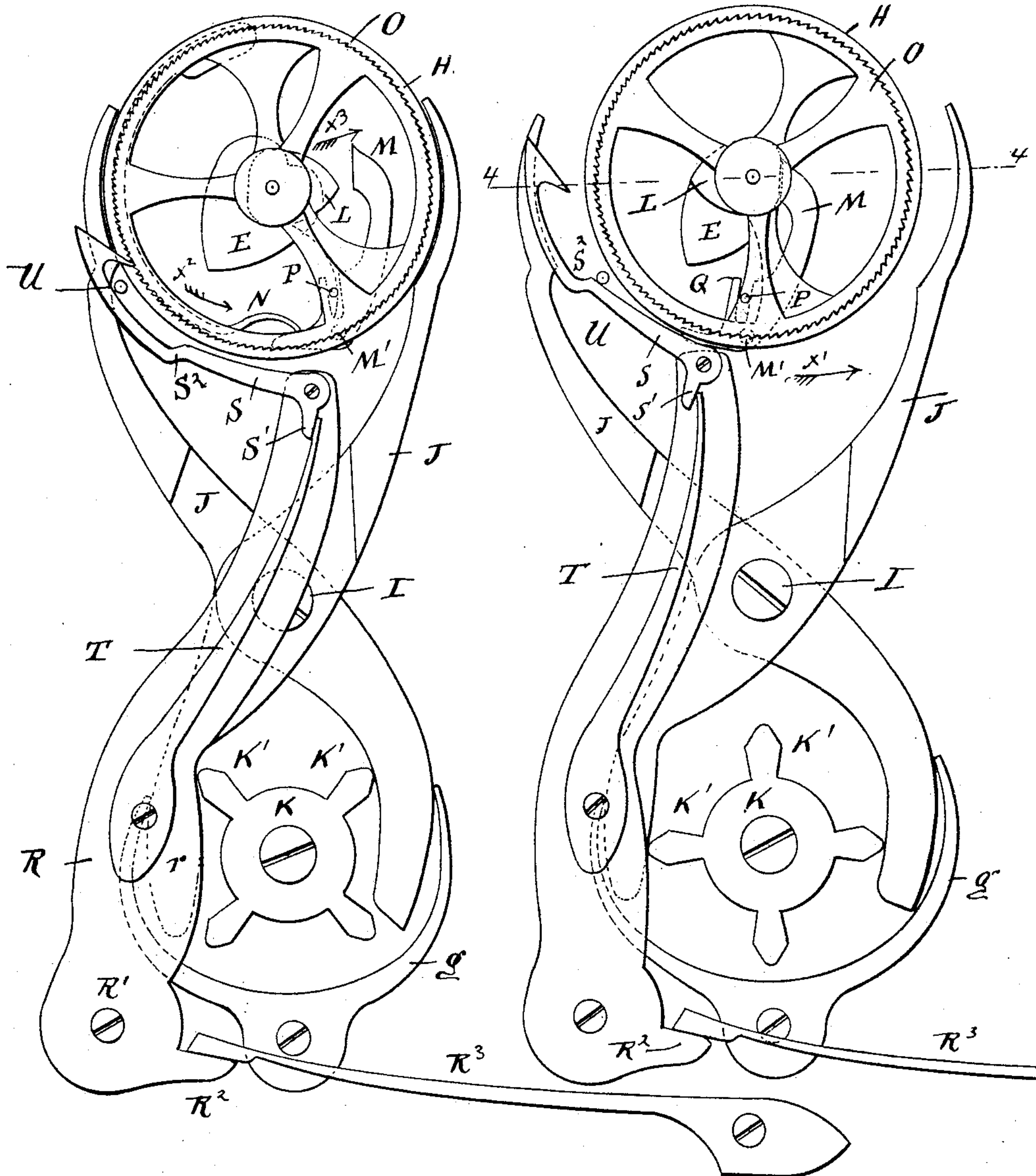
A. REYMOND.
STOP WATCH.

No. 474,100.

Patented May 3, 1892.

Fig. 1.

Fig. 2.



• WITNESSES:

Charles Schroeder
Charles Bles

INVENTOR

A. Raymond

BY

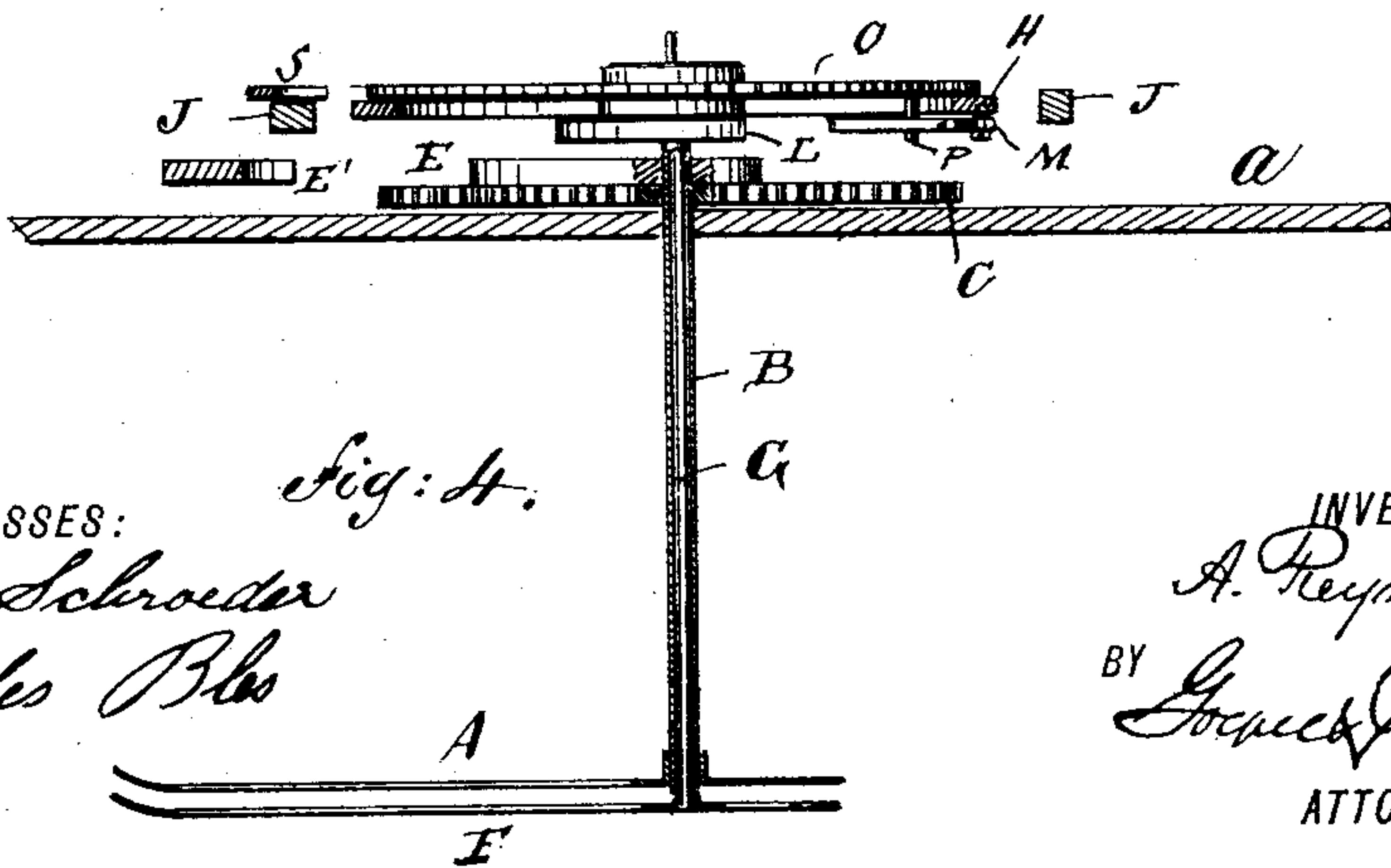
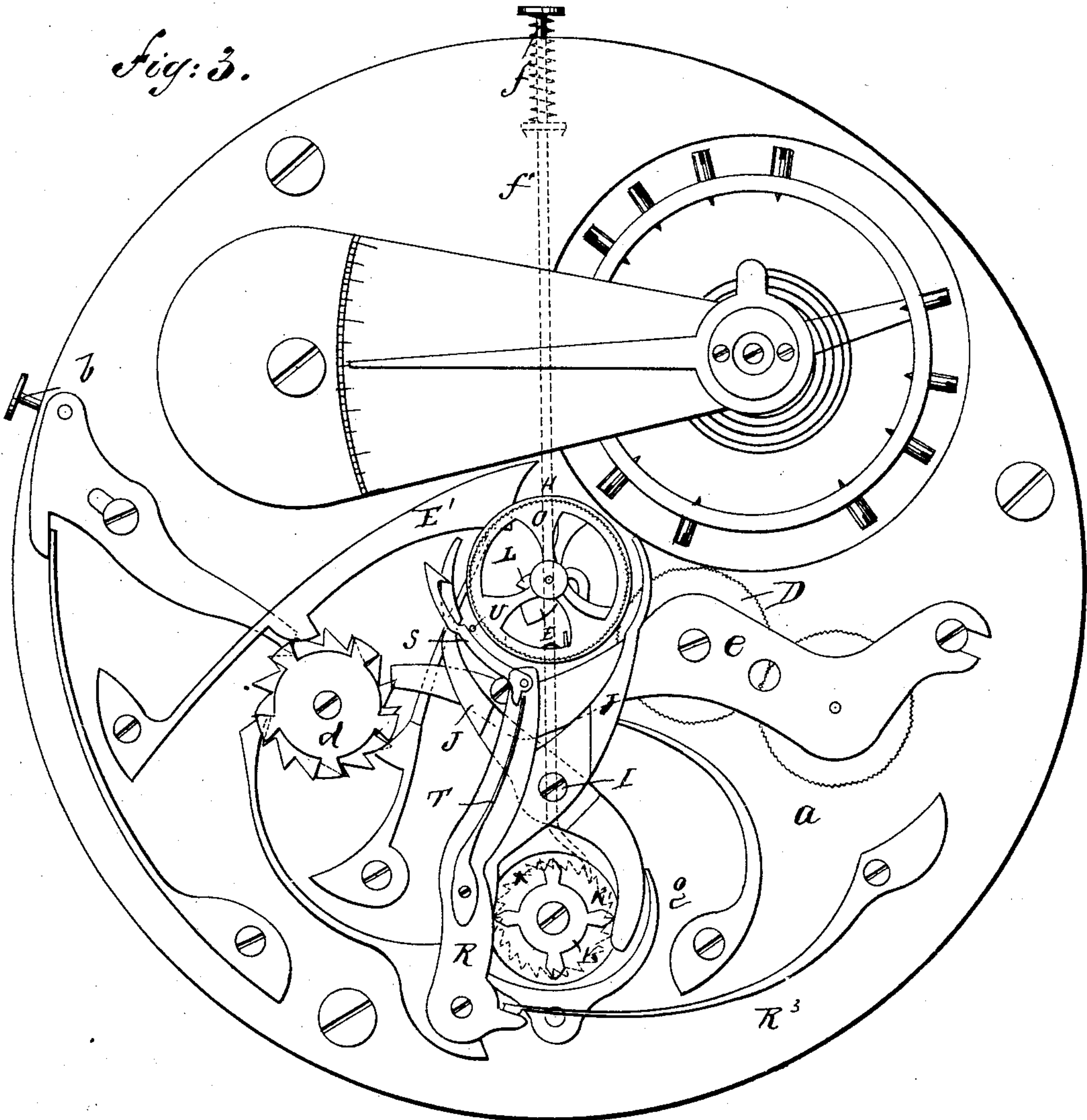
James P. Rogers
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Fig: 3.



WITNESSES:
Charles Schroeder
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Fig: 4.

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UNITED STATES PATENT OFFICE.

ADRIEN REYMOND, OF NEW YORK, N. Y.

STOP-WATCH.

SPECIFICATION forming part of Letters Patent No. 474,100, dated May 3, 1892.

Application filed October 19, 1891. Serial No. 409,159. (No model.)

To all whom it may concern:

Be it known that I, ADRIEN REYMOND, a citizen of Switzerland, and a resident of the city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Stop-Watches, of which the following is a specification.

This invention relates to improvements in stop-watches, and especially to that class of stop-watches known as "split-seconds stop-watches," and which are provided with two fly-back hands, which can be stopped independently. In watches of this kind the split-seconds hand is operated by a heart-cam, which is mounted on the arbor carrying the seconds-hand, and against which heart-cam a spring-pressed lever acts that is pivoted on the brake-wheel fixed on the arbor of the split-seconds hand. When the split-seconds hand is to be stopped, brake-jaws are operated, which embrace said brake-wheel, and thus hold the same. The arbor of the seconds-hand, however, continues to rotate, as does also the heart-cam on the same, and the result is that considerable friction is produced between the edge of the heart-cam and the lever resting against the edge of the same.

The object of my invention is to provide a watch of this kind, which is so constructed that as soon as the wheel on the arbor of the split-seconds hand is locked said lever is removed from the edge of the heart-cam and does not bear on the same during the rotations of said heart-cam, so that the watch-movement is relieved of a considerable amount of unnecessary work and operates much more accurately.

The invention consists in the combination, with the usual split-seconds mechanism, brake-wheel, and brake-levers, of an additional lever provided with a hook-pawl for engaging a tooth-wheel mounted loosely on the arbor of the split-seconds hand above the brake-wheel and provided with a pin adapted to act upon the heart-cam lever and to throw the same away from the edge of the heart-cam when the brake-levers are applied.

The invention also consists in the construction and combination of parts and details, as will be fully described hereinafter, and finally pointed out in the claims.

In the accompanying drawings, Figures 1 and 2 are enlarged detail plan views of the brake-levers, the brake-wheel, the heart-cams, the toothed wheel above the brake-wheel, and the pawl for opening said toothed wheel. Fig. 3 is a plan view of the back plate of the watch-movement, showing my improvement. Fig. 4 is a transverse sectional view on the line 4-4 of Fig. 2, parts being omitted.

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

The usual fly-back or seconds hand A is mounted on the tubular arbor B, carrying the toothed wheel C, adapted to be engaged with the stop-wheel D of the movement, said tubular arbor B also carrying the usual heart-cam E, on which the heart-cam lever E' can act. The split-seconds hand F is mounted on the arbor G, passing longitudinally through the tubular arbor B, and carrying at or near its upper end the fixed brake-wheel H, that can be embraced and acted upon by two brake-levers J, pivoted to the plate *a* at I, and actuated by the cam-wheel K, having four cam-teeth K', in the usual manner. The tubular arbor B carries a fixed heart-cam L directly below the brake-wheel H, and to the said brake-wheel the heart-cam lever M is pivoted at M', Figs. 1 and 2, on one end of which heart-cam lever M the spring N acts, that is secured to the under side of the brake-wheel H, said spring serving to press the end of the heart-cam lever M against the edge of the heart-cam L. Above the wheel H the wheel O, of slightly less diameter than the wheel H, is mounted loosely upon the arbor G, the rim of said wheel O being provided with ratchet-teeth. A pin P projects from one arm of the wheel O downward and into the notched prong or arm Q of the heart-cam lever M, so that when the wheel O is shifted in relation to the wheel H said pin P, acting on the edges of the notch of said prong or arm Q, shifts the heart-cam lever M. A lever R is pivoted at R' to the plate *a* of movement and is provided with a spur R², on which the spring R³ bears, said lever R having a cam-edge *r*, on which the cam-teeth K' of the wheel K can act while acting on the brake-lever J. To the end of the longer arm of the lever R a hook-pawl S is pivoted and is provided with a spur S', against which a spring T bears, that is fast-

ened on the lever R, said spring T serving to keep the hook end of the pawl S in engagement with the teeth on the rim of the wheel O. Said hook-pawl is provided at about one-half its length with a bend or shoulder S², as shown, and between said hook-pawl and the edge of the tooth-wheel O a fixed pin U projects upward from the plate *a*.

b is a push-pin for operating the combined ratchet and cam wheel *d*, which in turn operates the heart-cam lever E' and the slide *e*, carrying the chronograph-wheels, in the usual manner.

f is a push-button for operating the push-rod *f'*, the inner end of which acts on a ratchet-wheel connected with the wheel K.

g is a spring bearing against the brake-lever J.

To operate the stop-watch mechanism, the push-button *b* is pushed inward, whereby the stop-wheel D is brought in engagement with the wheel C, and the heart-cam-lever E' is moved from the large heart-cam E on the tubular arbor B. By means of the wheel D the tooth-wheel C, the tubular arbor B, and the heart-cams E and L are rotated. As the heart-cam lever M is pressed against the edge of the small heart-cam L by its spring N, said lever M and the brake-wheel H, to which it is attached, are compelled to participate in the rotary movements of said tubular arbor B. As the split-seconds arbor G is fixed to the brake-wheel H, it is also compelled to participate in the rotary movement, and thus the two hands A and F are moved together. The parts are now in the relative positions shown in Fig. 2. The brake-levers J do not rest against the brake-wheel H and the hook-pawl S rests against the pin U in the usual manner shown, and its hooked end is disengaged from the teeth of the tooth-wheel O. If the hand F is to be stopped, the push-button *f* is pushed inward, whereby the cam-wheel K is forced to make a quarter-turn, permitting the spring *g* to press the ends of the brake-levers J against the rim of the brake-wheel H, and at the same time permitting the spring R³ to throw the end of the lever R in the direction of the arrow X', Fig. 2, whereby the hook-pawl S is moved in the corresponding direction, and as the shoulder S² passes the pin U the spring T on the lever R throws the hook end of the pawl S in engagement with the tooth-rim of the wheel O, and said hook-pawl turns the wheel O in the direction of the arrow X², Fig. 1. The pin P of said wheel O, acting on the edges of the notch in the prong or arm Q, throws the cam-lever M in the direction of the arrow X³—that is, away from the edge of the heart-cam L on the tubular arbor B, and thus permitting said arbor and the heart-cam L to rotate without bearing against the lever M, which is held clear of the same, as shown in Fig. 1. The watch-movement is thus relieved of the labor of overcoming the friction between the edges of the moving heart-cam L and the heart-cam lever

M, as was necessary in the split-seconds watches made heretofore. When the hand A has been stopped by pushing the push-button B, the push-button *f* is again pressed inward, whereby another quarter-turn is given to the cam-wheel K, causing the teeth K' of the same to throw the levers J from the edges of the brake-wheel H and into the position shown in Fig. 2, and at the same time the lever R is moved in an inverse direction of the arrow X', and the pawl S is moved by the action of the pin U on the same into the position shown in Fig. 2, and the tooth-wheel O is released, permitting the spring N to throw the end of the heart-cam lever M against the edge of the heart-cam L, whereby the brake-wheel H, to which said lever M is pivoted, and the arbor G, to which said brake-wheel is attached, are turned so as to bring the two handles A and F in line again.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a stop-watch, the combination, with a tubular seconds-hand arbor and a split-seconds-hand arbor in said tubular arbor, of a heart-cam fixed on the tubular arbor, a brake-wheel fixed on the split-seconds-hand arbor, a heart-cam lever pivoted on said brake-wheel, brake-levers for gripping the brake-wheel, and mechanism for moving the heart-cam lever pivoted on the brake-wheel from the heart-cam fixed on the tubular arbor when the brake-levers are applied, substantially as set forth.

2. In a stop-watch, the combination, with a tubular seconds-hand arbor and a split-seconds-hand arbor passed through the same, of a heart-cam on the tubular arbor, a brake-wheel fixed on the split-seconds-hand arbor, a heart-cam lever pivoted to the brake-wheel, a tooth-wheel mounted loosely on the split-seconds-hand arbor and engaging the heart-cam lever, and a hook-pawl for operating said tooth-wheel, substantially as set forth.

3. In a stop-watch, the combination, with a tubular seconds-hand arbor and a split-seconds-hand arbor passed through the same, of a heart-cam on the tubular arbor, a brake-wheel fixed on the split-seconds-hand arbor, brake-lever for holding said brake-wheel, a heart-cam lever pivoted on the brake-wheel, a tooth-wheel mounted loosely on the split-seconds-hand arbor and engaging the heart-cam lever, a lever pivoted on one of the brake-levers, a hook-pawl on said lever, and means for operating the brake-levers and the lever pivoted on one of said brake-levers, substantially as set forth.

4. In a stop-watch, the combination, with a tubular seconds-hand arbor and a split-seconds-hand arbor passed through the same, of a heart-cam on the tubular arbor, a brake-wheel fixed on the split-seconds-hand arbor, brake-levers for holding said brake-wheel, a heart-cam lever pivoted to the brake-wheel, a pin on the brake-wheel engaging said heart-

cam lever, a tooth-wheel mounted loosely on the split-seconds-hand arbor, a lever pivoted on one of the brake-levers, a hook-pawl pivoted to said lever and provided with a bend
5 or shoulder, and a fixed pin between said hook-pawl and the rim of the tooth-wheel, substantially as set forth.

10 5. In a stop-watch, the combination, with a tubular seconds-hand arbor and split-seconds-hand arbor passed through the same, a heart-cam on the tubular arbor, a wheel fixed on the split-seconds-hand arbor, a heart-cam

lever pivoted on said wheel, and means for bringing said lever out of contact with said heart-cam on the tubular arbor, substantially
15 as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ADRIEN REYMOND.

Witnesses:

OSCAR F. GUNZ,

CHARLES SCHROEDER.