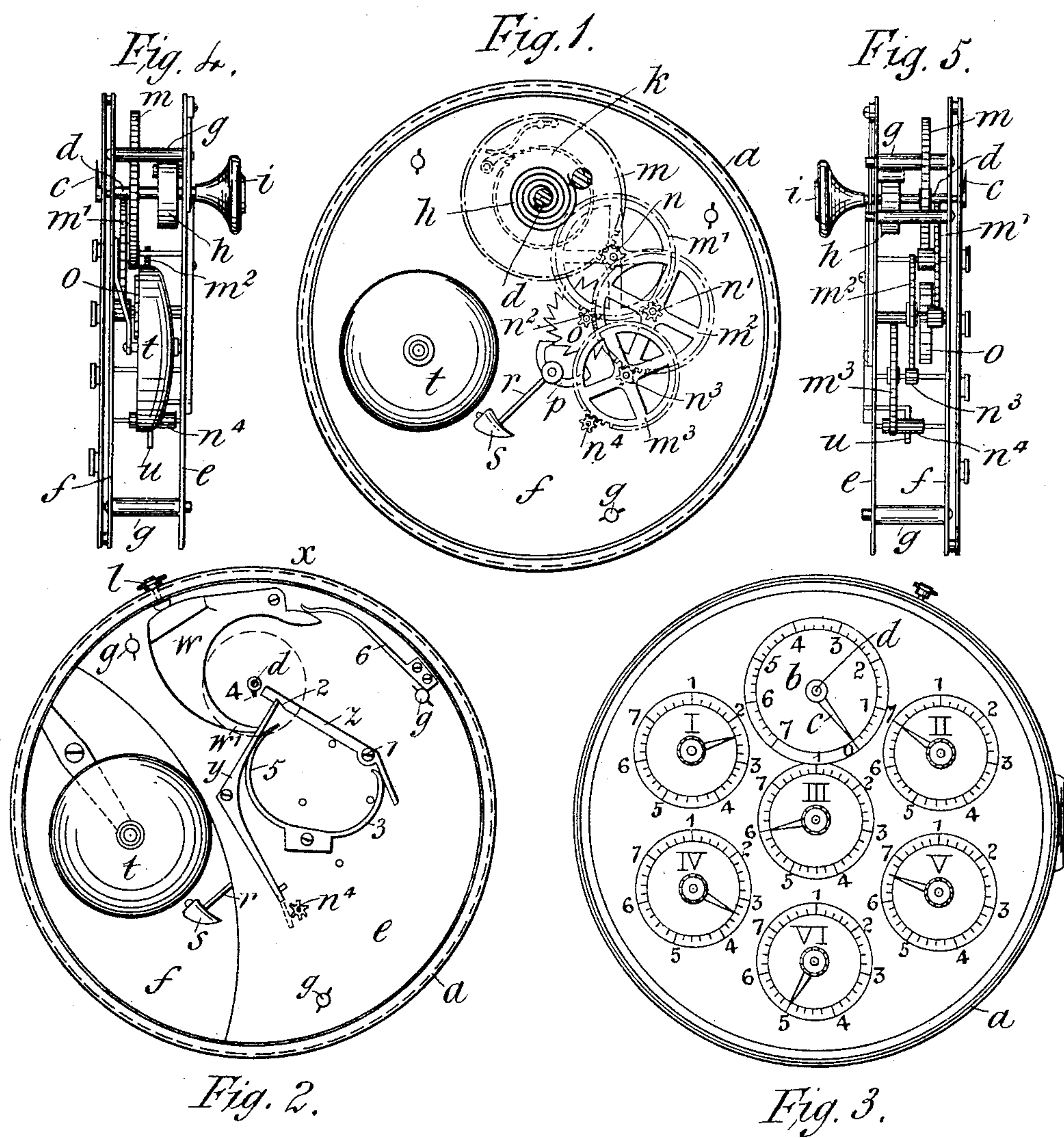


(No Model.)

W. E. GIBB.
TIME SIGNAL.

No. 464,016.

Patented Dec. 1, 1891.



Witnesses:-
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UNITED STATES PATENT OFFICE.

WILLIAM EDWARD GIBB, OF PYRGO PARK, ENGLAND.

TIME-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 464,016, dated December 1, 1891.

Application filed November 18, 1890. Serial No. 371,889. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EDWARD GIBB, a subject of the Queen of Great Britain, residing at Pyrgo Park, in the county of Essex, England, have invented an Improved Device for Measuring Short Intervals of Time, of which the following is a specification.

My invention relates to improvements in devices for measuring short intervals of time— as, for instance, where a photographic sensitive surface has to be exposed to light for a very few seconds; and the objects of my improvement are, first, to provide means whereby an index-hand can be readily set to the required period of time which is to be measured; second, to enable the measuring device to be set in motion at the instant required; third, to produce an audible sound during the period of time which is to be measured, and, fourth, to cause the index-hand to stop directly the desired period of time which is to be measured has elapsed. I effect these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a view from the back with the back plate removed. Fig. 2 is a view from the back with the back plate in place. Fig. 3 is a front view. Fig. 4 is a view from the left hand, and Fig. 5 a view from the right hand.

Similar letters and numerals refer to similar parts in the several figures.

a is a cylindrical case of metal or other material, and having at its front a dial b , divided into spaces representing a certain number of seconds, which again are further subdivided into fifths or other fractions of a second. The dial b is provided with a hand or index c , carried upon a spindle d , which turns in holes in the parallel plates $e f$, which form a frame and are held together by stays $g g g$. The spindle d is made to make a sufficient part of a single revolution, when required, by means of the coiled spring h . At the other end of the spindle d at the back of the case is fixed a knob or handle i , by which the spindle can be turned so as to wind up the spring h , and adjust the index-hand c to any desired point, the spring being prevented from uncoiling by a ratchet-wheel and pawl k in the usual way. I also provide a knob or button l , by pressing which the spindle d is released, in the man-

ner hereinafter described, and the index-hand c allowed to return to its normal position.

In order that the hand c may so return at exactly the requisite speed, so that its point passes between two of the principal divisions on the dial b in exactly one second, I connect a train of toothed wheels $m m' m^2$ and pinions $n n' n^2$ to the main index-spindle d , and upon the spindle of the last pinion n^2 I fix a toothed escapement-wheel o , the teeth of which act upon an escapement p of the usual form, which is accordingly made to oscillate rapidly backward and forward as the wheel o revolves. The spindle of the escapement p also carries an arm r , provided at its end with a small hammer s , which as it oscillates strikes a bell t or other sounding device, so that when the apparatus is in action the sound is audible.

By carefully adjusting the escapement p and the oscillating hammer s the speed of the index-hand c can be readily adjusted, so that it passes over each principal division of the dial b in exactly one second.

n^3 is a pinion, which is also driven by the toothed wheel m^2 , and its spindle carries the toothed wheel m^3 , which drives the pinion or cylinder n^4 , and u is a wire, which, when pressed lightly against the teeth of the pinion n^4 , instantly stops the revolution of the whole train of wheels, but when removed allows them to revolve freely.

In order to insure the continuance of the movement of the index-hand c if the pressure upon the knob l should be removed, I use the following arrangement, as shown in Fig. 2: The inner end of the knob l presses upon a lever w , turning upon a center x , the end of the lever at w' pressing upon the lever y , which carries at its other end the wire u , the pressure of which upon the pinion or cylinder n^4 prevents the index-hand c from moving round, as already described, until the knob l is pressed.

z is a lever turning upon the center 1 and having an angular notch at 2, which is pressed against the angular end of the lever y by a spring 3, so as to hold it back and prevent it from returning when the pressure upon the knob l ceases, and so stopping the revolution of the index-hand c .

Upon the spindle d of the index-hand c is

fixed a projecting pin or cam 4, which raises the lever z and allows the lever y to be forced out by the spring 5 and the wire u to be pressed against the pinion n^4 , and so stop the further movement of the index-hand c , such stoppage taking place at the moment when the index-hand has returned to the point marked zero (0) upon the dial.

6 is a spring by which the lever w and the knob l are returned to their normal position when pressure upon the latter is removed.

The action of the mechanism described is as follows: The index-hand c is first turned round by the knob i until it points to the number of seconds and fractions of seconds which are to be measured for the exposure of a photographic sensitive surface. At the moment when the exposure commences the knob l is pressed down and the lever w presses back the lever y , one end of which removes the wire u from the pinion n^4 , while its other end is caught and held in the notch 2 in the lever z . The train of wheels and the index-hand c are instantly set in motion by the spring h , and at the same time the bell t is sounded by the hammer s , operated by the escapement p and the escapement-wheel o . At the moment when the zero-point is reached by the hand c and the exposure is completed the projecting pin 4 has raised the lever z and released the lever y , the wire u coming in contact with the pinion n^4 , stopping the further movement of the index-hand and the sound of the bell t .

In Fig. 3 additional dials, numbered I to VI, are shown, each of which is provided with an index-hand. These index-hands have no connection with the mechanism described, but may be turned round by hand to record the

exact time of exposure of different sensitive plates or surfaces having corresponding numbers upon them. The case a is provided with a hinged glass front and with a metallic back, through which the knob or handle i projects.

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

1. In a device for measuring short intervals of time, the combination of the dial b , index-hand c , spindle d , spring h , knob i , toothed wheels $m m' m^2$, pinions $n n' n^2$, escapement-wheel o , and escapement p , all substantially as set forth and shown.

2. The combination of the dial b , index-hand c , spindle d , spring h , knob i , toothed wheels $m m' m^2$, pinions $n n' n^2$, escapement-wheel o , escapement p , hammer s , and bell t , all substantially as set forth and shown.

3. In combination with the spring h , toothed wheels $m m' m^2$, pinions $n n' n^2$, escapement-wheel o , an escapement p , the toothed wheel m^3 , pinions $n^3 n^4$, and movable wire u , substantially as set forth and shown.

4. In combination with the pinion n^4 , driven by the spring h , wheels $m m' m^2 m^3$, pinions $n n' n^2 n^3$, the wire u , lever y , lever z , notch 2, lever w , knob l , projecting pin 4, and springs 3, 5, and 6, all substantially as set forth and shown.

In testimony whereof I have hereunto set my name in the presence of two witnesses.

WILLIAM EDWARD GIBB.

Witnesses:

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