H. A. LUGRIN, DEC'D.

C. LUGRIN, ADMINISTRATRIX.

WATCH FOR COUNTING THE PULSE BY SOUND OR TOUCH.

916,953. APPLICATION FILED JUNE 12, 1908. Patented Mar. 30, 1909.

Fig: 1.

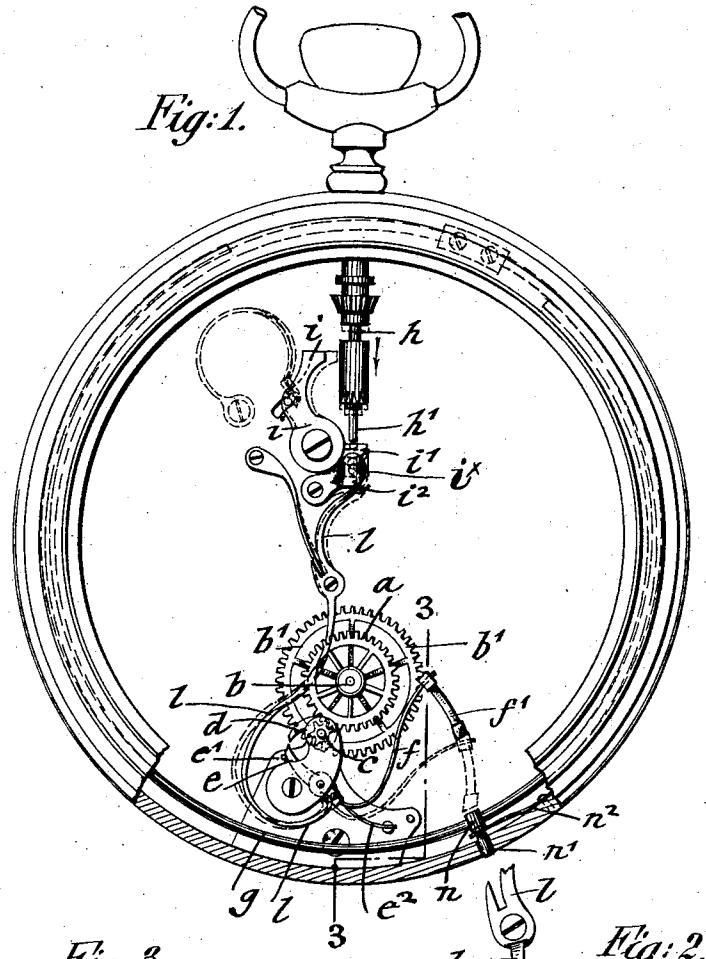


Fig: 3.

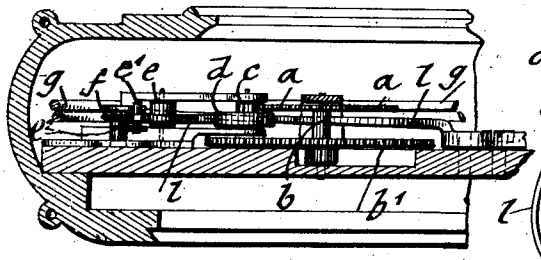
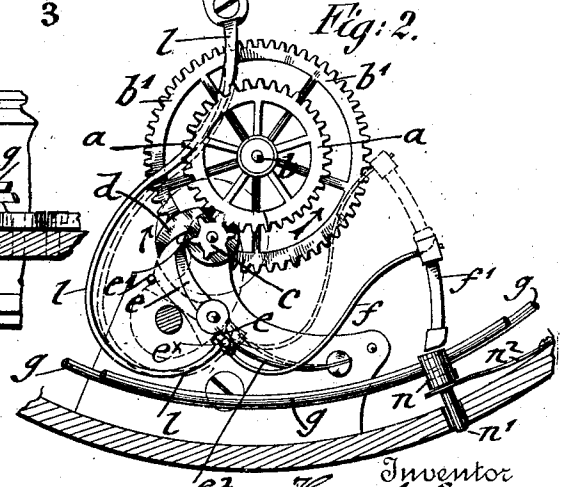


Fig: 2.



Witnesses:
Mollie D. Avidon
H. J. Sulzbier.

Inventor
Henry A. Lugrin
By his Attorneys
Howell & Howell.

THE NORRIS PETERS CO., WASHINGTON, D.C.

UNITED STATES PATENT OFFICE.

HENRY A. LUGRIN, OF NEW YORK, N. Y.; CHRISTINE LUGRIN, OF BROOKLYN, NEW YORK, ADMINISTRATRIX OF SAID HENRY A. LUGRIN, DECEASED.

WATCH FOR COUNTING THE PULSE BY SOUND OR TOUCH.

No. 916,953. Specification of Letters Patent. Patented March 30, 1909.

Application filed June 12, 1908. Serial No. 438,024.

To all whom it may concern:

Be it known that I, HENRY A. LUGRIN, a citizen of the United States of America, residing at New York, in the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Watches for Counting the Pulse by Sound or Touch, of which the following is a specification.

This invention relates to certain improvements in watches to be used by physicians for counting the pulse, and more especially to a watch by which the pulse can be counted in the dark without looking at the second-hand, either by sound or touch.

In many cases it is inconvenient to count the pulse in connection with the movements of the second-hand of the watch, either at night or in dimly-lighted rooms, or when the physician is shortsighted and cannot read off the seconds with the exactness required. The improved watch enables the physician to take the pulse in a dark room or in places where it is impossible to make the observation of the watch by sight.

The object of the invention is to apply to the watch a comparatively simple attachment by which the pulse may be taken either audibly by sound by holding the watch to the ear, or sensibly by touch by holding the watch in the hand and counting off the time; and for this purpose the invention consists of an attachment for watches by which a time-beating mechanism indicating periods of time and causing the striking of a bell and the actuation of a pusher is set in operation by a setting mechanism operated by the crown and stem of the movement, as will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a top-view of a watch with the top-plate removed and showing my improved pulse-counting attachment in position of rest, Fig. 2 is also a top-view, showing the main operative parts on a larger scale and in their second or actuated position, and Fig. 3 is a detail vertical transverse section on line 3, 3, Fig. 1.

Similar letters of reference indicate corresponding parts.

My improved attachment for taking the pulse by sound or touch is applied to the intermediate plate of the movement and inserted either in new watches or applied to old watches, as desired.

The attachment consists of a toothed driving wheel a which is fastened to the arbor b of the fourth wheel b^1 of the watch-movement. The driving wheel a gears with a pinion c to the arbor of which is applied a snail d which acts during each rotation of the pinion on the outer end of a fulcrumed hammer-lever e and gradually moves the same toward the extreme end of the snail. The short opposite end of the fulcrumed hammer-lever e is acted upon by the free end of a flat spring e^2 and provided with a curved hammer-arm f which carries at its outer end a hammer f^1. At each full rotation of the pinion c and snail d the fulcrumed and spring-actuated lever e is quickly released from the snail d, so that the hammer f^1 at the outer end of the curved arm f strikes the free end of a bell g, which is formed of a circular steel-rod that is located in and attached to the hollow interior portion of the center of the watch-case. The mechanism described forms the time-beating or indicating mechanism.

The pinion c is provided with six teeth and rotated by the driving gear-wheel a, which has 36 teeth, so that the pinion is rotated six times per minute by the gear-wheel a and the fourth wheel b^1. In place of rotating the snail once for every six teeth, any other proportion between the teeth of the driving wheel and pinion may be employed, such as sixty teeth for the driving wheel and ten teeth for the pinion, but it is believed that the period of ten seconds, corresponding either to the proportion of 36 teeth to 6, or 60 teeth to 10, is the most convenient unit for taking the pulse. As with every ten seconds the snail makes one full rotation, the hammer-lever is gradually moved outwardly and then quickly released, and the bell sounded by the stroke of the hammer, so that the physician can readily count the pulse by holding the watch to the ear and count the beats of the pulse between two successive strokes of the bell and then obtain the beats per minute by multiplying the number of beats counted between the strokes of the bell by six.

For setting the striking mechanism in position for taking the pulse, a setting mechanism is employed which is operated by the crown and stem of the watch. After press-

ing the crown down, it is necessary to keep it in depressed position until the pulse is taken. As soon as the crown is released, the setting mechanism is returned to its initial or normal position and the actuation of the striking mechanism interrupted. The setting mechanism comprises an elongation h^1 on the lower end of the stem h, which engages a nose i^1 on the lower end of a fulcrumed and spring-actuated steadying lever i. The nose i^1 bears against a pin $i^\times$ extending rearward from a pivoted arm i^2, so that said arm may be depressed, and said arm rests upon the upper shorter end of a curved, fulcrumed and spring-actuated lever l. The longer end of the lever l bears against a pin $e^\times$ on the shorter end of the hammer-lever e and normally holds said hammer-lever in inoperative position against a stop-pin e^1 in opposition to the spring e^2 of said hammer-lever. When the crown is depressed the lever l is moved away from the hammer-lever, as shown in full lines in Fig. 2, which permits the spring e^2 to act on the hammer-lever and push its longer end into the path of the snail d, whereupon the hammer-lever and its hammer will be actuated. As soon as the pressure on the crown is released, the starting mechanism is returned to its initial position and the longer end of the hammer-lever returned by the action of the lever l into position against the stop-pin e^1, as shown in full lines in Fig. 1 and in dotted lines in Fig. 2.

For indicating the pulse by touch, a pusher n which is located near the hammer-end of the lever e is actuated simultaneously with the striking of the bell g. The shank n^1 of the pusher n passes through a perforation in the watch-case center to the outside of the same, being rounded off at the outer end. The pusher n is carried by a flat spring n^2, which has an eye at its free end and which is attached to the watch-case center at its opposite end. The head of the pusher n is located sidewise of the bell in such a manner that the hammer-head strikes the bell and pushes at the same time. When the watch is to be used for taking the pulse by touch, the crown is depressed in the same manner as before, and simultaneously with the sounding of the bell by the action of the rotating snail, the hammer-lever is quickly actuated so as to cause the hammer-head to strike the bell and pusher. As the watch is held in the hand, the shank of the pusher is moved outwardly and pressed against the palm of the hand holding the watch every ten seconds, thus enabling the physician to count the pulse during two successive strokes of the hammer and the sudden pressure of the pusher-shank on the hand, and then find the pulse per minute by multiplying the beats taken between two successive actuations of the pusher by six. As soon as the crown is released, the sounding of the bell and the actuations of the pusher are interrupted and the operative parts of the time-beating and setting mechanisms returned to their normal or initial position, ready for repeated use.

By the improved attachment physicians are enabled at a comparatively small extra expense to take the pulse of patients without the visible observation of the second-hand, either by sound by bringing the watch to the ear and counting the beats of the pulse between two successive strokes, or by touch by holding the watch in the hand and counting the pulse between the strokes indicating by the pusher on the palm of the hand.

In place of applying the attachment to a watch, it can also be made up as a separate device in connection with a watch-movement arranged in a case, but without the use of a dial, hands and hand-setting mechanism.

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

1. The combination, with a watch-movement, of a gear-wheel on the arbor of the fourth wheel, a pinion meshing with said gear-wheel, a snail driven by said pinion, a sounding device, a hammer-lever normally held out of the path of said snail, and means for moving said lever into the path of the snail.

2. The combination, with a watch-movement, of a gear-wheel on the arbor of the fourth wheel, a pinion meshing with said gear-wheel, a snail driven by said pinion, a sounding device, a hammer-lever normally held out of the path of said snail, and means operated from the crown of the watch and operating only when the crown is depressed to move said lever into the path of said snail.

3. The combination, with a watch-movement, and a sounding device, of a snail driven by the watch-movement, a hammer-lever normally held out of the path of the snail, and means operated from the watch-crown to move said lever into the path of said snail.

4. The combination, with a watch-movement, of a snail driven thereby, a sounding device, a hammer-lever, a lever acting on said hammer-lever to normally hold the same out of the path of said snail, a spring tending to hold said hammer-lever in the path of said snail, and a connection between said first-named lever and the watch-crown whereby the depression of the latter permits said spring to act.

5. The combination, with a watch-movement, of a sounding device, a pusher, a hammer to actuate both of the same, and hammer-actuating mechanism.

6. The combination, with a watch-movement, of a bell and pusher located in the hollow portion of the center of the watch-case, hammer mechanism interposed between the fourth wheel of the movement and the hammer, said mechanism consisting of a gear-

wheel on the arbor of the fourth wheel, a pinion meshing therewith, a snail on the arbor of the pinion, a fulcrumed and spring-actuated hammer-lever actuated by the snail and provided with a hammer-arm and hammer for striking the bell and pusher, and intermediate mechanism between the stem and hammer-lever for setting the time-beating mechanism into operative position.

7. The combination, with a watch-movement, of a bell and pusher located in the hollow portion of the center of the watch-case, hammer mechanism interposed between the fourth wheel and the bell and pusher, said mechanism consisting of a gear-wheel on the arbor of the fourth wheel, a pinion meshing therewith, a snail on the arbor of the pinion, and a fulcrumed and spring-actuated hammer-lever provided with a hammer-arm and hammer for striking the bell and pusher, and a starting mechanism between the stem of the movement and the hammer-lever for setting the actuating mechanism and permitting the taking of the pulse by sound or touch.

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

HENRY A. LUGRIN.

Witnesses:
PAUL GOEPEL,
HENRY J. SUHRBIER.