

(No Model.)

O. H. WOODWORTH.
CHRONOSPHYGMOMETER.

No. 596,293.

Patented Dec. 28, 1897.

Fig. 1.

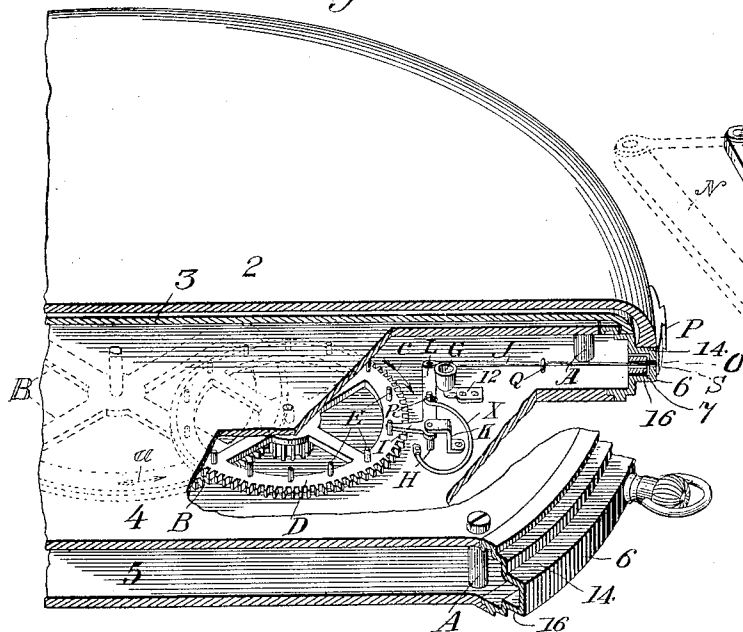


Fig. 4.

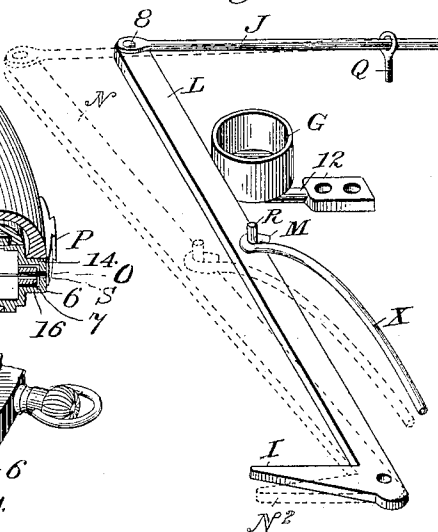


Fig. 2.

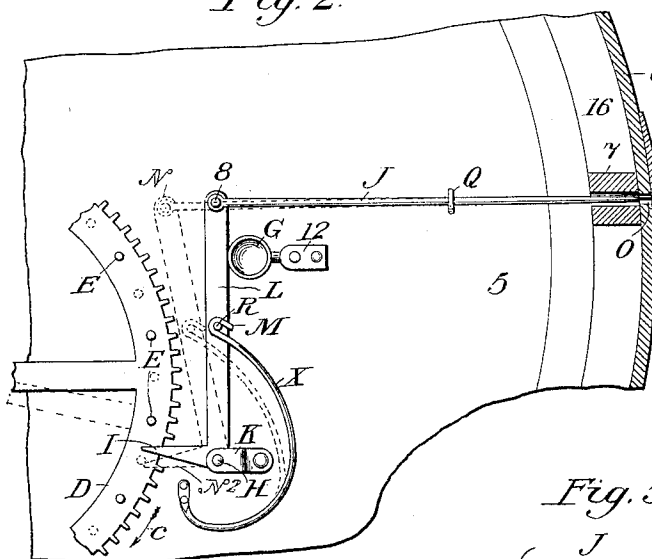


Fig. 3.

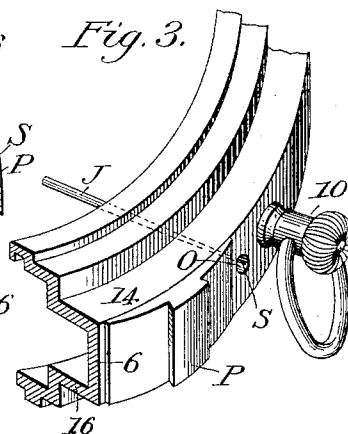
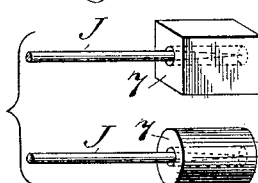


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

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CHRONOSPHYGMOMETER.

SPECIFICATION forming part of Letters Patent No. 596,293, dated December 28, 1897.

Application filed March 29, 1897. Serial No. 629,883. (No model.)

To all whom it may concern:

Be it known that I, ORSON H. WOODWORTH, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Chronosphygmometers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in chronosphygmometers or sphygmometric watches; and it consists, essentially, in the connection and combination, with the running-movements of ordinary watches, of certain devices for timing and enumerating the beats of the human pulse or of any pulsatory object or body, and is especially adapted for the use of physicians or surgeons.

This invention can be effectively used in darkness or light and by the exercise of the sense of feeling or hearing, as may be desired. It is well adapted for use by medical practitioners afflicted with partial or total blindness and is useful under all circumstances in noting the circulation, respiration, or other regularly-recurrent movements of various objects.

The invention is fully described and illustrated in this specification and accompanying drawings, in which similar letters and figures of reference indicate corresponding parts throughout the several views.

In the drawings, Figure 1 is a general view of the operative parts of the invention shown in practical connection and combination with portions of the outer casing and the running-movements of an ordinary watch. Fig. 2 is an enlarged view of the pulsatory lancet J and the devices immediately connected therewith. Fig. 3 is a view of a portion of the outer casing, the lancet extending from the interior of the watch outwardly to and through an opening in the rim of the casing, and the sliding lancet guard or protector. Fig. 4 shows the bell-shaped stop G secured to the movement-plate 5, and Fig. 5 shows the lancet-sheath for passage of the lancet to opening O.

An essential feature of this invention consists in so constructing and combining the different elements thereof that a pointed reciprocating lancet or needle is made to extend from the interior of the sphygmometric watch outwardly to and through an opening in the extreme periphery or rim of the casing, and said lancet is so actuated by its interior connection with the running-movements of the watch that at regular intervals of time, as once, twice, or three times every minute, the point of said lancet is thrust outwardly with sufficient force to be perceptibly felt by a finger or other part of a hand lightly held on or over said opening. Said outward thrusts are preferably caused to occur every half-minute, and thus the practitioner by feeling the thrusts and counting his patient's pulse-beats occurring between two successive thrusts of the lancet readily learns the number of beats per minute. The patient's circulation can thus be accurately taken in darkness or light and his respiration can be taken similarly without opening the watch or looking at any portion of it.

In the drawings numeral 2 shows an outer lid of the watchcasing, and 3 the inner cap thereof.

4 represents the upper and 5 the lower plate of the watch-movement held in position by the usual posts A A. The plates retain and support between them center wheel B, third wheel D, and other portions of the operative parts of a watch not necessary to be here shown.

6 shows the extreme outer rim or periphery of the casing of a watch, and 14 and 16 show the casing on each side of the rim.

E E represent timing-pins inserted in the face of wheel D at equal distances apart, said distances each representing one-half minute in the revolution of said wheel when the watch is running and keeping correct time.

K shows a bracket attached to plate 5 and supporting staff H, which is pivotally adapted to said plate and bracket and carries lever L, having the extension or spur I, and carrying lancet J, freely jointed to said lever at 8 and guided in its thrusts by guide or loop Q, attached to plate 5. Stop G limits the extent of the outward thrusts of lancet J. Thrusting-spring X, attached to plate 5,

actuates lever L, being attachable thereto at will by hook M on its outer end, adapted to catch onto stud R, inserted in said lever.

10 represents, in Fig. 3, the stem or pendant of the watch; 6, the rim of the casing; O, the opening in the rim; S, the point of the lancet in the opening; 14 and 16, the casing on each side of the rim, and P represents the sliding guard suitably fitted to the outer rim of the casing and movable back and forth thereon at will by moderate pressure to cover and protect or uncover the opening and the lancet-point therein. For this purpose the rim 6 is provided with a lug 61, fitting snugly in an undercut elongated recess 62 in the guard P, as shown in Fig. 2.

G shows a bell-shaped sonorous stop attached to a suitable support 12, which is secured to plate 5, as shown.

7 shows a lancet sheath or tube securely fastened between the sides 14 and 16 of the casing by soldering or otherwise and serving as a channel for the passage of the lancet outward to the opening O in the rim 6 of the casing. By thus soldering or otherwise securely fastening the sheath between the sides of the casing the rim and sides of the casing are materially stiffened and strengthened near the point where the opening is made in the rim.

The following is a description of the practical operation and uses of this invention.

The watch with which this my improved chronosphymometer is connected and combined being wound up, running, and keeping time, the revolution of wheel D in the direction of arrow c brings a timing-pin E against the spur or short arm I of lever L and presses it backward, as per dotted lines N, and thereby simultaneously moves lever L and withdraws the point S of lancet J inward from opening O in rim 6 correspondingly, as per dotted lines N², until said timing-pin passes beyond the point of the spur, whereupon lever L is instantly turned on pivoted staff H and driven back against stop G by the force of thrusting-spring X, and said lever, spur, and lancet are all by said force instantly carried back to their present positions, as shown by the drawings, and thus an outward thrust of the lancet is accomplished, and as each timing-pin in succession as wheel D revolves presses back and passes the point of the spur an outward thrust of the lancet-point through opening O is in like manner effected. These outward thrusts of the lancet-point through the opening in the rim are continuous and repeated every half-minute, and the practitioner can at any time desired move the sliding guard, uncover the opening and the lancet-point therein, and practically utilize the chronosphymometer, as heretofore described.

Stop G is made bell-shaped and provided with a support which is attached to plate 5 in order to render said stop sonorous to a limited degree, so that when lever L strikes said stop

in thrusting the lancet outward, as aforesaid, a sound is produced by each stroke of the lever against the stop that can be plainly heard and distinguished above the ordinary ticking of the sphygmometric watch when the same is held near the ear of a person whose hearing is of average acuteness. By thus constructing and attaching stop G, as shown and described, and utilizing the periodical strokes of the lever necessarily made by the force of thrusting-spring X in actuating the lancet-thrusts the lever performs two important and mechanically inseparable offices—to wit, it carries the lancet in its reciprocating movements and produces a distinctly audible sound, louder than the ticking of the watch, by striking the stop coincidentally with each outward thrust of the lancet. As the lever strikes the stop with every outward thrust of the lancet the practitioner can utilize either the thrusts of the lancet or the coincidental sounds of the bell in determining the circulation or respiration of his patients. By using the chronosphymometer he can employ any one of three methods—viz., feel the lancet-thrusts, hear the strokes of the lever, or see the movements of the seconds-hand—as he may prefer, and count accordingly.

The original elements of this invention can be readily attached to or connected with watches now in use or constructed, applied to, and combined with watch movements and cases as they are newly manufactured.

The opening O in the rim of the casing may be made as near the pendant as may be found convenient or desirable.

I claim as my invention, and desire to secure by Letters Patent of the United States, the following:

1. In a chronosphymometer, the combination of a watch-movement, a rim-perforated casing therefor, timing-pins carried by a wheel of said movement, a lever actuated by the successive engagements of said timing-pins with a spur of said lever, a staff carrying said lever and pivoted in a cock and a plate of the movement, a sonorous bell-shaped stop, a thrusting-spring adapted to drive said lever against said stop and produce a sound simultaneously with each outward thrust of a lancet carried by said lever, substantially as set forth.

2. In a chronosphymometer, the combination of a watch-movement, a rim-perforated casing therefor strengthened near said perforation by the lancet-sheath as set forth, a lever carrying a lancet and so actuated by timing-pins carried by a wheel of the movement as to periodically cause said lever to withdraw said lancet within the casing, a thrusting-spring to periodically thrust said lancet outward through said perforation and simultaneously cause said lever to strike a sonorous stop immediately after its spur is successively released by each of said timing-

pins, a staff carrying said lever and supported by a cock and a plate of said movement, a thrusting-spring, a sonorous stop, a lancet carried by the lever, a lancet-sheath secured between the sides of the casing, and the perforation in the rim of the casing, substantially as set forth.

3. In a chronosphygmometer, the combination of a watch-movement, a rim-perforated and lancet-sheath-strengthened casing therefor, a lever actuated by timing-pins which conjointly with a thrusting-spring periodically and alternately cause to be withdrawn inwardly and thrust outwardly through said sheath and said perforation a lancet carried by said lever and a sonorous stop to be sounded by the periodical strokes of said lever thereon, substantially as set forth.

4. In a chronosphygmometer the combination of a watch-movement, a casing therefor with a lancet-passage opening in the rim thereof, a lever carried by a staff and conjointly actuated reciprocally and alternately by a thrusting-spring and by timing-pins carried by a wheel of the movement, a sonorous stop adapted to be sounded at regular intervals by successive strokes of said lever thereon, a thrusting-spring, a lancet carried by said lever and periodically and alternately thrust outwardly by said thrusting-spring and withdrawn inwardly by said timing-pins, a lancet-guide, a lancet-sheath adapted to serve as a lancet-channel and to strengthen the casing, and an opening in the casing-rim for the out-

ward passage of the lancet-point, substantially as set forth.

5. In a chronosphygmometer the combination of a sonorous stop, a lever adapted for continuous periodical strokes on said stop and the means herein described for actuating said lever, substantially as set forth.

6. In a chronosphygmometer the combination of a sonorous stop, a lever adapted for successive periodical strokes thereon, a lancet carried by said lever, and the herein-described means for actuating said lever and lancet coincidentally, substantially as set forth.

7. In a chronosphygmometer, the combination of a watch-movement, a casing therefor with a lancet-passage perforation in the rim thereof, a lever carried by a staff and actuated by timing-pins carried by a wheel of the movement, said staff pivoted in a cock and a plate of the movement, a lancet carried by said lever, a thrusting-spring secured to a plate of the movement, the means described for connecting said spring with the lever, a sonorous stop to be periodically sounded by the successive strokes of the lever thereon, a lancet-guide, the lancet-sheath secured between the sides of the casing, the lancet-passage perforation in the rim of the casing, and the sliding guard, all substantially as set forth.

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Witnesses:

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