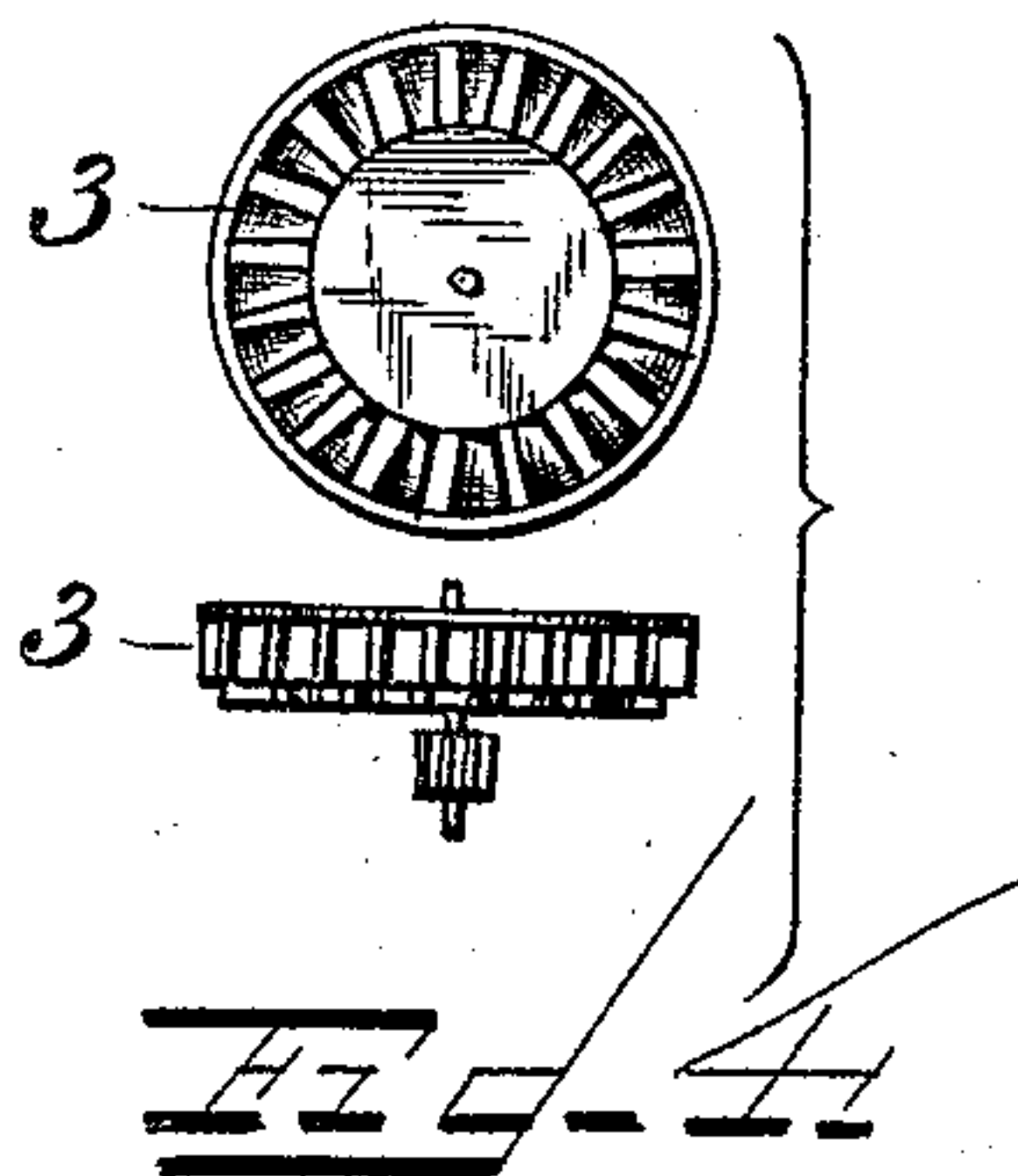
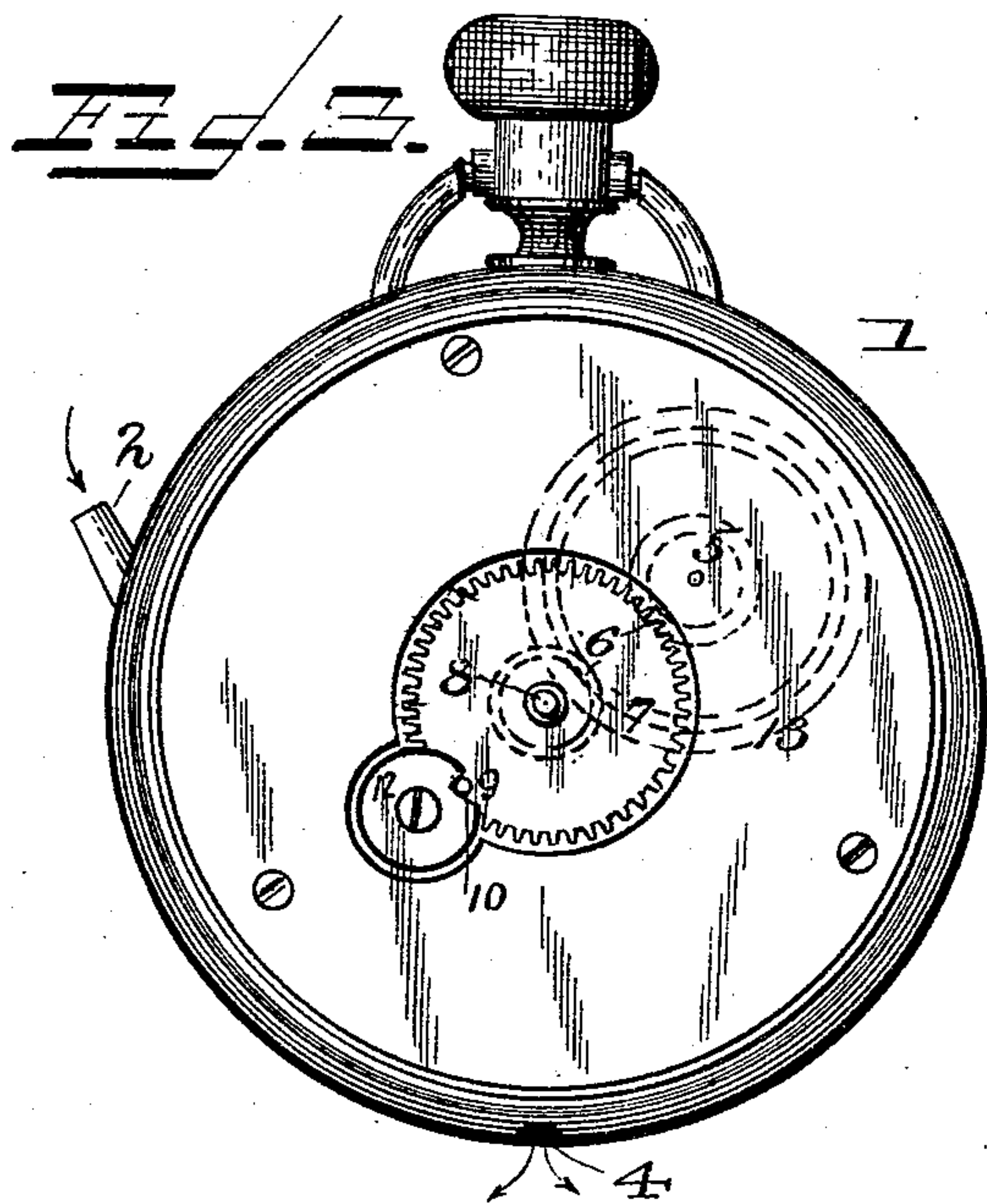
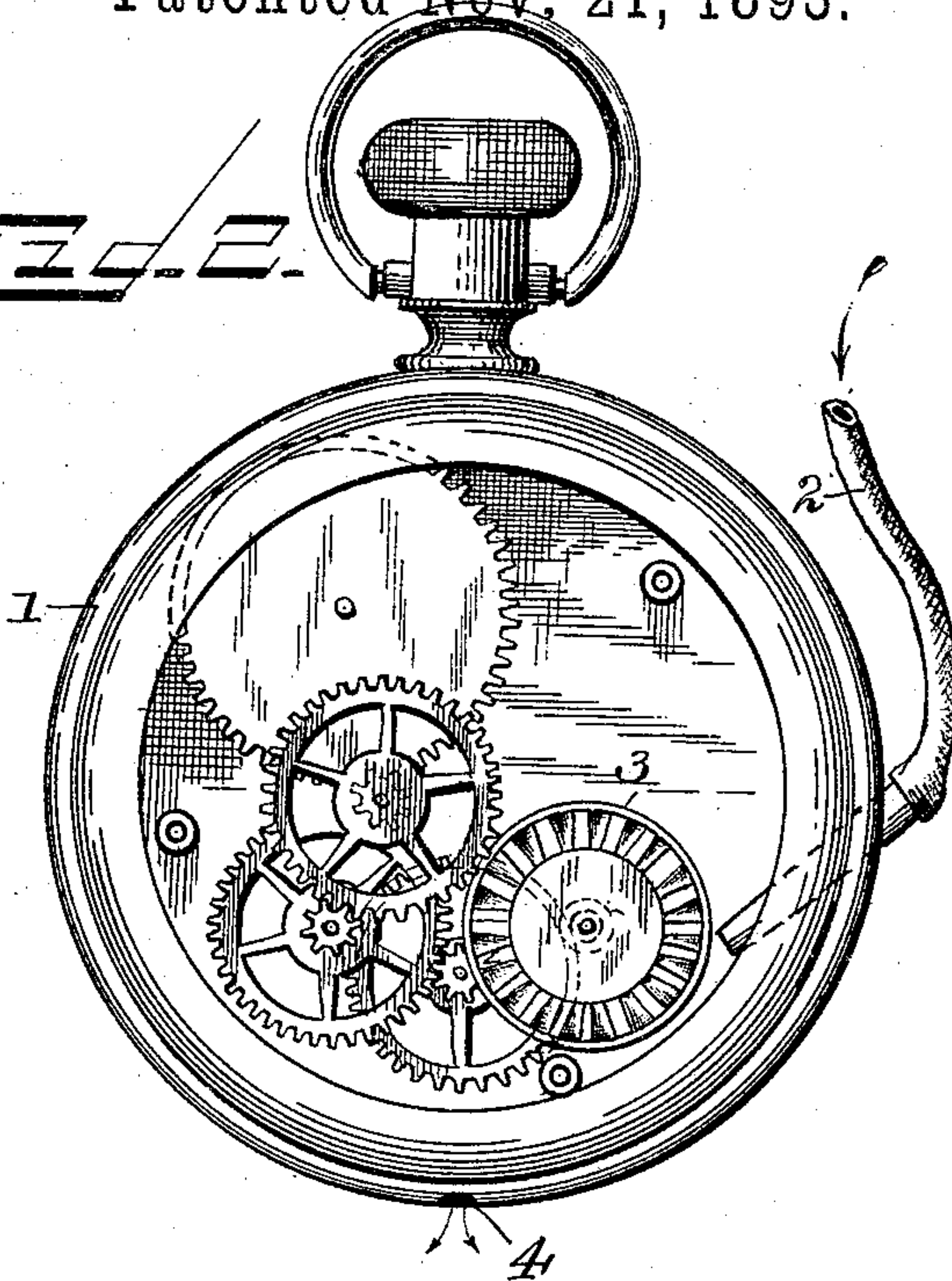
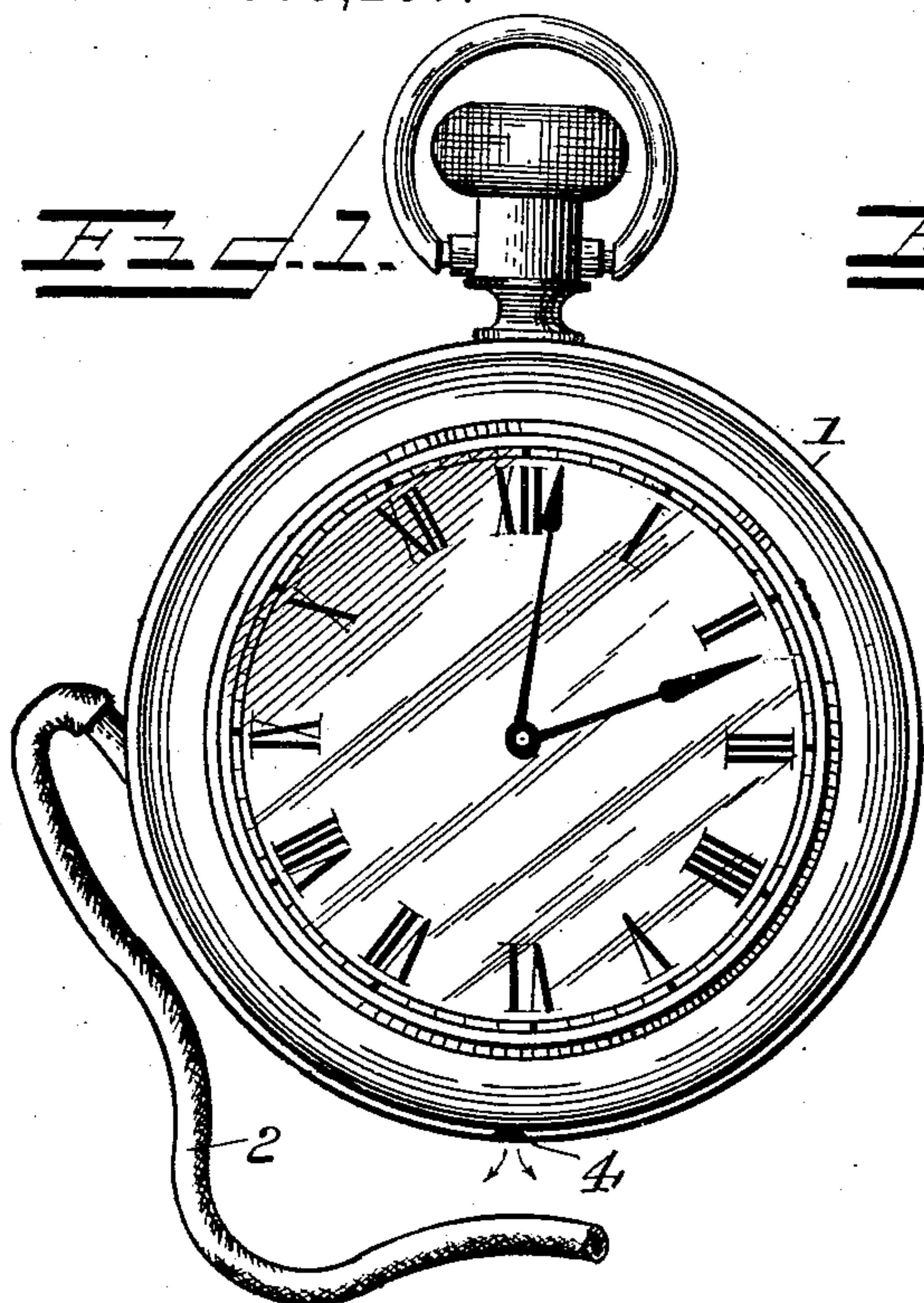


(No Model.)

C. W. DELANEY.
LUNG TESTER.

No. 509,207.

Patented Nov. 21, 1893.



WITNESSES
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UNITED STATES PATENT OFFICE.

CHARLES WILLSON DELANEY, OF HAMMOND, INDIANA, ASSIGNOR TO JOSEPH W. DYSARD, OF SAME PLACE.

LUNG-TESTER.

SPECIFICATION forming part of Letters Patent No. 509,207, dated November 21, 1893.

Application filed March 2, 1893. Serial No. 464,472. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WILLSON DELANEY, a citizen of the United States, and a resident of Hammond, in the county of Lake and State of Indiana, have invented certain new and useful Improvements in Lung-Testers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in lung testers, and it consists essentially in applying a tube to a hole, or aperture in the case of an ordinary watch, and providing the escapement wheel of the movement with a wind wheel in such manner that when a current of air is directed upon the wind wheel from the tube, said wheel will be rotated, which in turn will actuate the movement and turn the hands thereof, the main spring returning the hands to normal position when the air current is disconnected, as will hereinafter be fully set forth.

In the accompanying drawings: Figure 1 is a face view of an ordinary watch case with my improvements applied thereto. Fig. 2 is a rear view of the same, with the back removed. Fig. 3 is a front view of the time-piece with the crystals, the dial, and the hand removed. Fig. 4 is a detail view showing the wind-wheel.

In the said drawings, the reference numeral 1 designates the watch case having a hole or aperture in its rim communicating with the interior thereof. With this hole is connected a flexible tube 2. Upon the escapement shaft of the movement, is fixed a wind wheel 3 in such position that a current of air from the tube will strike and rotate the same. The escapement wheel and balance are dispensed with, so that the escapement shaft is free to rotate. The movement otherwise, may be of any ordinary description, so that the detailed description and illustration thereof are not deemed necessary. The movement is so arranged and regulated that when in normal

position, the hands of the watch point to 12 on the dial. If a person now blows through the tube the current therefrom will impinge upon the wind wheel and rotate the same and through the train of gearing, the hands will be moved around the dial like in an ordinary time piece, the resistance of the main spring determining the force of the current necessary to turn the hands, and the number of hours and minutes covered by the hands showing the strength of the lungs. With a lung tester of the construction or character shown, a current sufficient to turn the hands eight or ten hours will indicate ordinarily sound lungs. When the air current is discontinued, the main spring will return the hands to normal position. A small hole 4, should be made in the case for the escape of the air after acting on the wind-wheel. By the above construction a cheap, convenient and ornamental lung tester is produced by which the strength of the lungs can be accurately tested.

For the purpose of preventing the hands from passing beyond normal position upon the return movement thereof, I provide the following means. Secured to the shaft 5 of the spring barrel is a pinion 6, which meshes with a gear-wheel 7, loose on the arbor 8, of the hour-hand. The front face of this wheel is provided with a pin or stud 9, which is adapted to engage with a beveled notch 10, in the periphery of a small wheel 12, journaled in the front plate 13. When the hands are moved by means of the wind wheel and gearing the spring is wound up and through the medium of its shaft the pinion 6, the cog wheel 7 will be rotated in the same direction as the hands and its stud or pin 9, will slide off of the beveled face of the notch 12. Upon the return movement of the hands wheel 7 will be rotated in the opposite direction where its stud will engage with the notch and check its movement and consequently the movement of the spring shaft and gear wheels which move the hands. It will be noted that the pinion 6 being much smaller than the wheel 7, the latter will rotate much slower than the hands. By this means the hands will be enabled to move around the dial a number of

times before the wheel 12 has made a single revolution, and the stud or pin come into engagement with wheel 13, behind the notch.

Having thus described my invention, what
5 I claim is—

1. In a lung tester of the character described, the combination of the escapement shaft, the wind wheel thereon, the air tubes, the hands, the spring barrel and its shaft and the train
10 of gearing, substantially as described.

2. In a lung tester of the character described, the combination with the escapement shaft, the wind wheel thereon, the air tube, the hands, the spring barrel and its shaft, and

the train of gearing, of the pinions fixed to 15 the shaft of the spring barrel, the gear wheel loose on the shaft or arbor of the hands, provided with a stud or pin and the wheel having a beveled notch with which said pin or stud engages, substantially as and for the pur- 20 pose specified.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

CHARLES WILLSON DELANEY.

Witnesses:

JOHN A. STEVENSON,

J. S. BLACKMAN.