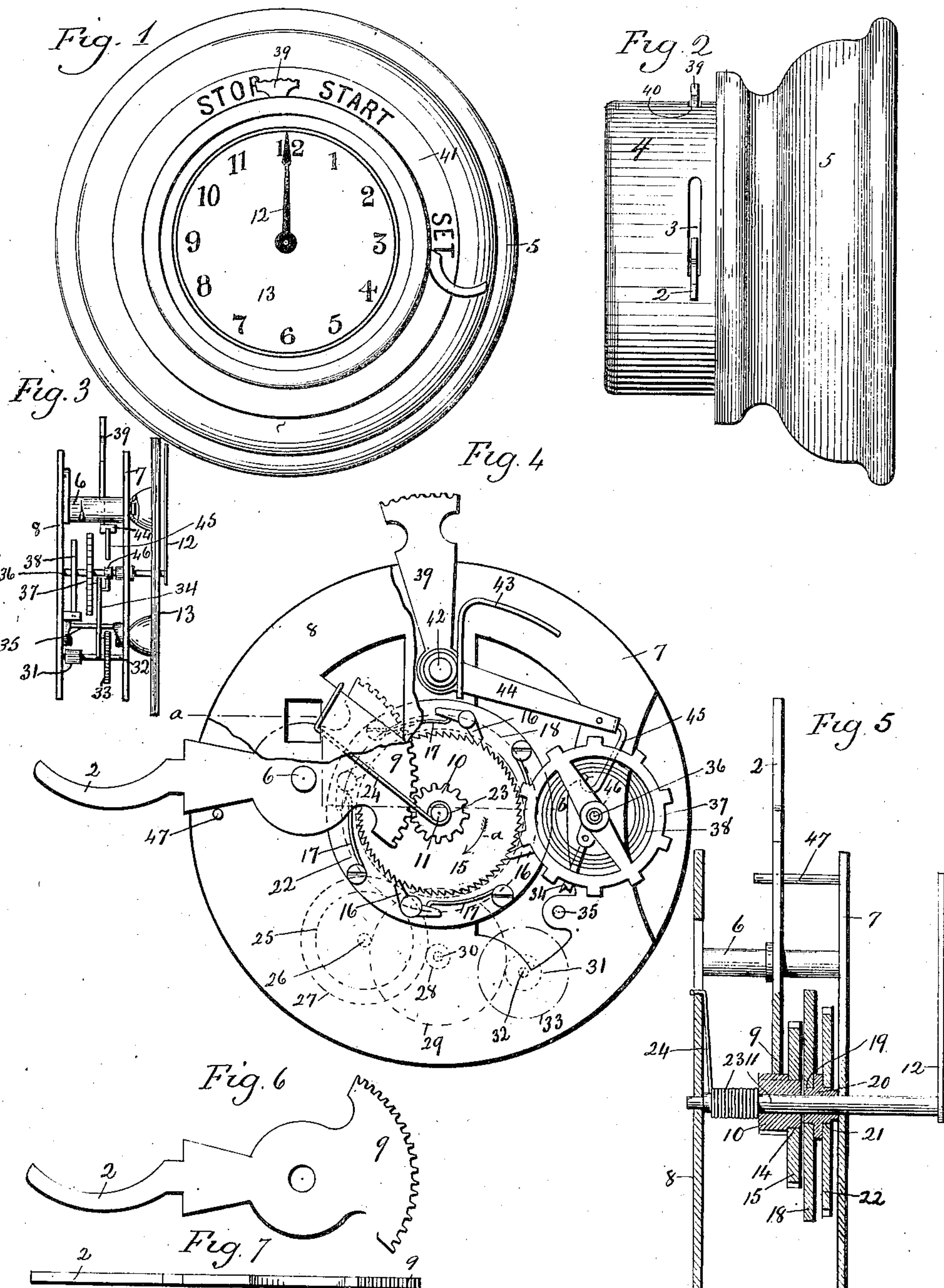


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W. E. PORTER.  
TIME LIMIT CLOCK.  
APPLICATION FILED OCT. 29, 1906.



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## TIME-LIMIT CLOCK.

No. 847,689.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed October 29, 1906. Serial No. 341,066.

*To all whom it may concern:*

Be it known that I, WILSON E. PORTER, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Time-Limit Clocks; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in front elevation of a time-limit clock constructed in accordance with my invention; Fig. 2, a view thereof in side elevation; Fig. 3, a detached edge view of the movement of my improved clock; Fig. 4, a detached view of the movement in rear elevation, on an enlarged scale, with a portion of the rear-movement plate broken away; Fig. 5, a view of the movement in horizontal section on the same scale on the line *a b* of Fig. 4; Fig. 6, a detached plan view of the combined winding and resetting lever; Fig. 7, an edge view thereof.

My invention relates to an improvement in "time-limit" clocks, so called because they are designed to be used wherever it is desired to measure a short period of time—as, for instance, the time occupied in long-distance telephoning; and so on, the object being to produce a simple, compact, convenient, and reliable clock of the character described.

With these ends in view my invention consists in a time-limit clock having certain details, of construction and combinations, of parts as will be hereinafter described, and pointed out in the claims.

As herein shown, I employ a combined winding and resetting lever formed at its outer end with a finger 2, which projects outward through a slot 3 in the exposed forward end of a tubular sheet-metal case 4, the rear end of which is inserted into a base or standard 5 of any convenient form, material, and construction. The said lever is hung upon a shaft 6, journaled at its ends in the front and rear movement plates 7 and 8, and formed at its extreme inner end with a segmental rack 9, which meshes into a winding and resetting pinion 10, rigidly secured to the center shaft 11 of the clock-movement, the rear end of this shaft being journaled in the rear-

movement plate 8 and its forward end being extended through the front-movement plate 7 and furnished with a minute-hand 12, which sweeps over a dial 13, which will be graduated according to the particular use to which the clock is to be put. The said pinion 10 is formed at its forward end with an annular shoulder 14, upon which is staked or otherwise rigidly secured a ratchet-wheel 15, which therefore rotates with the pinion 10 and shaft 11. The said ratchet-wheel 15 is engaged by one or more pawls or dogs 16, operated by springs 17, and mounted upon the rear face of a disk 18. As shown, there are four of these pawls; but the number may be varied as desired. The said disk 18 is staked upon an annular shoulder 19 at the rear end of a hub 20, loosely mounted upon the shaft 11 and having its forward end formed with an annular shoulder 21 for the rigid attachment of the center-wheel 22 of the movement. Under this construction the disk 18, the hub 20, and the center-wheel 22 revolve as one piece upon the shaft 11. The power for running the movement is furnished, as shown, by a spiral spring 23, encircling the rear end of the shaft 11 with which its forward end is connected, while its rear end is formed with a long hook 24, hooked into the rear-movement plate 8. By depressing the finger-piece 2 of the combined winding and resetting lever the rack 9 at its inner end will be elevated with the effect of rotating the pinion 10 and the ratchet-wheel 15 in the direction of the arrow *a*, Fig. 4, whereby the spring 23 will be wound by the corresponding rotation of the shaft 11, to which the pinion 10 is rigidly secured. While the combined winding and resetting lever is being operated as described the pawls 16 will ride over the teeth of the ratchet-wheel 11; but as soon as the shaft stops its reverse or winding movement the pawls will engage with the said teeth, and the power of the spring 23 will be thrown upon the shaft 11 to turn the same in the opposite direction, and so tend to operate the escapement-train, which will vary in construction and arrangement according to the particular construction of the clock. As shown, the train comprises a large pinion 25, meshed into by the center-wheel 22 and corresponding to the third-wheel pinion of an ordinary movement. This pinion 25 is mounted upon



a shaft 26, carrying a third wheel 27, meshing into a fourth-wheel pinion 28, turning with a fourth wheel 29, mounted upon a shaft 30. The fourth wheel 29 meshes into an escapement-pinion 31 on an escapement-shaft 32, which carries an escapement-wheel 33, coacting with an escapement-lever 34, mounted on a shaft 35 and coacting with a balance-wheel shaft 36, carrying a balance-wheel 37 and a hair-spring 38. All of these parts are well known in their construction, subject to variation, and need not be more particularly described.

For stopping and releasing the train I employ a stop-lever 39, having its outer end toothed and projecting outward through a slot 40 in the case 4, so as to stand in front of a ring 41, applied flatwise to the front of the base 5 and displaying the words "Stop" and "Start" and "Set," the two former being arranged with reference to the said lever 39 and the latter to the finger-piece 2. The said lever 39 is mounted upon a shaft 42, journaled at its ends in the movement-plates 7 and 8 and engaged by a friction-spring 43, which holds the shaft in any position into which it may be turned by the lever. At its inner end this lever is formed with an arm 44, carrying a spring 45, arranged in position to rub upon a collar 46 on the balance-wheel shaft 36. The spring-finger 45 exerts just enough pressure upon the collar 46 to restrain the train, which starts off immediately upon the removal of the finger 45 from contact with the collar 46 by the swinging of the lever 39 to the left. In order that the hand 12 may be stopped in its zero position with respect to the dial 13, a stop-pin 47 is mounted in the rear-movement plate in position to be engaged by the combined winding and resetting lever at the moment the shaft has been reversed into the position in which the hand is brought to the zero position on the dial. Some other means might be employed for stopping the combined winding and resetting lever, the only point being that it shall be invariably stopped in a predetermined place, so as to position the hand 12 over the zero-point on the dial.

In using my improved time-limit clock it is only necessary to depress the finger-piece 2 of the winding and resetting lever, which is but the work of an instant. The clock is then started by throwing the starting-lever 39 to the right and stopped by the slight pressure required to throw it to the left. The position of the hand 12 over the dial 13 now indicates the period of time that has elapsed between the starting and stopping of the clock.

I claim—

1. In a time-limit clock, the combination with a train, of a center shaft carrying a hand or pointer, a pinion and a ratchet-wheel located thereon, a spring for turning the shaft

the forward rotation of which drives the train, a combined winding and resetting lever formed with a rack meshing into the said pinion for reversely rotating the same and so winding the said spring and positioning the said hand, and means for coupling the shaft with the train when the spring is wound and the hand positioned.

2. In a time-limit clock, the combination with the center shaft thereof, of a pinion and a ratchet-wheel located on the said shaft and rotating therewith, a spring connected with the shaft, a combined winding and resetting lever formed with a rack meshing into the said pinion for reversely rotating the shaft and so winding the spring and positioning the shaft, a center-wheel within which the shaft turns, and means for coupling the said center and ratchet wheels.

3. In a time-limit clock, the combination with the center shaft thereof, of a pinion and a ratchet-wheel located thereon and rotating therewith, a spring connected with the shaft, a combined winding and resetting lever formed with a rack meshing into the said pinion for reversely rotating the shaft and so winding the spring and positioning the shaft, a center-wheel within which the shaft turns, and pawls for coupling the said center and ratchet wheels.

4. In a time-limit clock, the combination with the center shaft thereof, of a pinion and a ratchet-wheel located thereon and rotating therewith, a spring connected with the shaft, a combined winding and resetting lever formed with a rack meshing into the pinion for reversely rotating the shaft and so winding the spring and positioning the shaft, a center-wheel within which the said shaft turns, a disk turning with the said center-wheel, and pawls mounted upon the said disk and engaged with the said ratchet-wheel which turns under them when the shaft is being reversely rotated.

5. In a time-limit clock, the combination with the center shaft thereof, of a pinion and a ratchet-wheel located on the said shaft and rotating therewith, a spring connected with the shaft, a combined winding and resetting lever formed with a rack meshing into the said pinion for reversely rotating the shaft and so winding the spring and positioning the shaft, a center-wheel within which the shaft turns, means for coupling the said center and ratchet wheels, a time-train driven by the said center-wheel, and stop mechanism coacting with the said train for releasing and starting the same.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILSON E. PORTER.

Witnesses:

C. L. WEED,

GEORGE D. SEYMOUR.