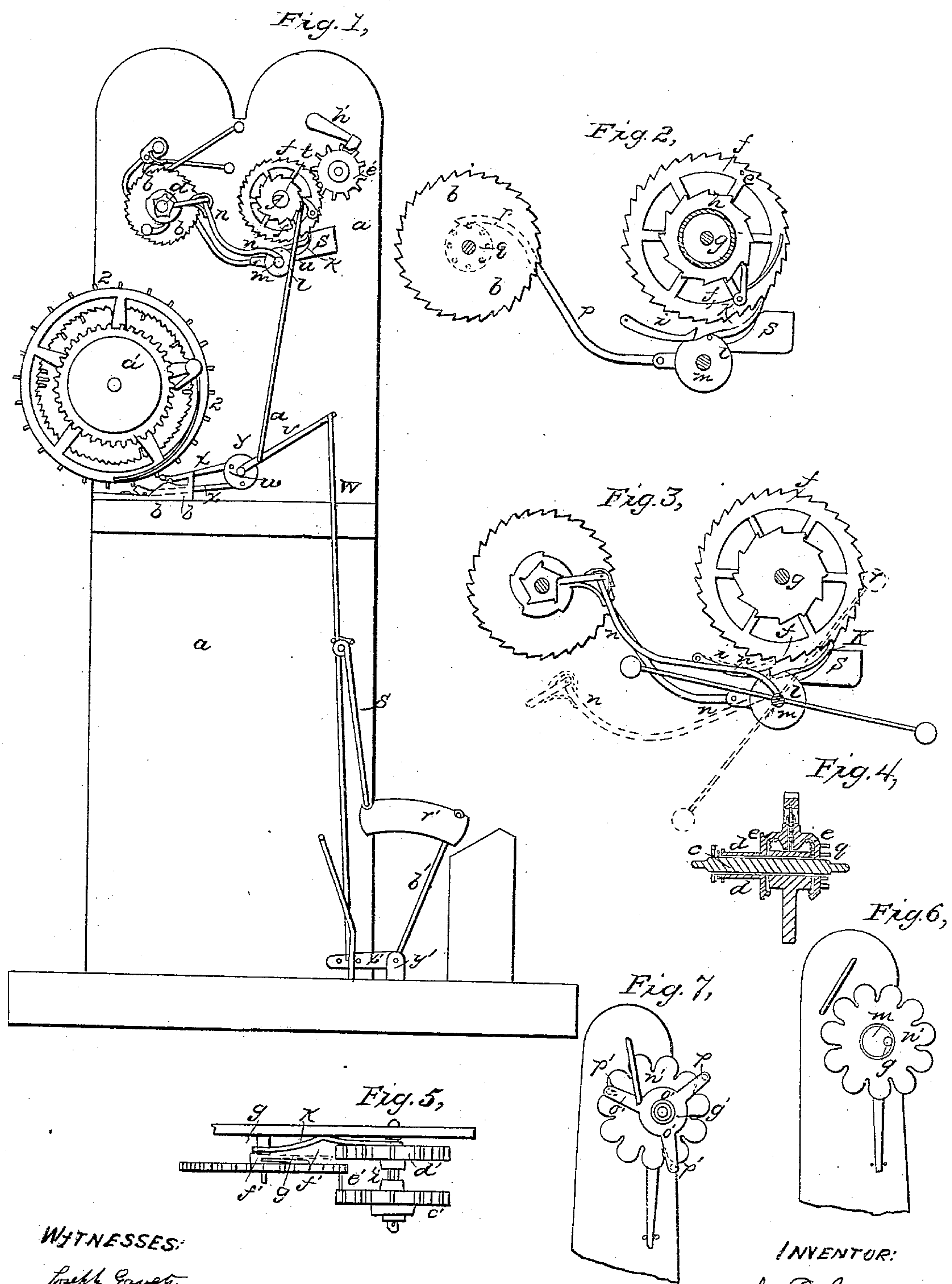


A. D. CRANE.
Clock Escapement.

No. 19,351.

Patented Feb. 16, 1858.



WITNESSES:

Joseph Gavett
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INVENTOR:

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UNITED STATES PATENT OFFICE.

A. D. CRANE, OF BOSTON, MASSACHUSETTS.

PUBLIC CLOCK.

Specification of Letters Patent No. 19,351, dated February 16, 1858.

To all whom it may concern:

Be it known that I, A. D. CRANE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Church-Clocks, and that the following description, taken in connection with the accompanying drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, by which my invention may be distinguished from others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

The figures of the accompanying plate of drawings represent my improvements.

Figure 1 is a side elevation showing the interior of the clock. Figs. 2, 3, 4, 5, 6 and 7 are detail views to be hereinafter referred to and explained.

The present invention consists in an entire new arrangement of devices for producing the movements in a church clock, the objects aimed at being to simplify its construction and also to produce an accurate time-keeper.

By my improvements the pendulum as well as the hands are driven by a weight acting upon a drum and independently of each other. By the usual mode of construction, a series of wheels is required for driving the pendulum and also for carrying the hands, the devices being connected to and dependent upon each other.

In the present case but one wheel is required for actuating the pendulum and one for carrying the hands, while the actuating devices of the pendulum and hands are entirely independently of each other. The drum for driving the pendulum and also that for actuating the hands, are made to receive an intermittent rotary motion for winding up their driving weights, by the action of the parts themselves, whereas it has heretofore been necessary to wind them up by hand. I also have made an improvement in the manner of actuating the hour hand, which will be hereinafter fully explained.

a a in the drawings represent the supporting framework of the clock.

b b is the wheel by the movement of which the pendulum is carried. On the shaft *c* of this wheel is a drum *d* upon which is wound a cord attached to a weight that

thereby drives the pendulum wheel *b b*. This weight is wound up every minute by the revolution of the drum *d* actuated through the bevel gears *e e*, &c., as will be presently explained.

f is the wheel that drives the hands, they being attached to the shaft *g* of this wheel. Upon the shaft *g* is a drum *h* upon which is wound a cord, to which a weight is attached. This cord is wound up every hour as will be hereinafter explained.

i, k are the escapements to the wheel *f* and are made alternately to engage with and disengage from the teeth of the said wheel by the movement of a cam *l* as clearly shown in Figs. 2 and 3, the cam *l* being attached to a turning shaft *m*. To this shaft *m* is fastened a drop lever catch *n n*, which extends to a ratchet wheel *o*, Fig. 3, on the shaft of the wheel *b* that drives the pendulum. This drop-lever catch *n n* when the ratchet wheel *o* has been turned sufficiently by the running down of the weight on the drum *d*, drops from the said ratchet wheel *o*, as shown by dotted lines in Fig. 3, and thereby turns the cam *l* on the shaft *m* causing the escapement *k* to be disengaged from the teeth of the wheel *f* that drives the hands, and allowing the said wheel to move one tooth or the minute hand one minute, and then preventing its moving farther by bringing the escapement *i* to engage with the teeth of the said wheel by the same movement of the cam *l*. The falling of the drop-lever catch also winds up the cord and weight that carries the pendulum drum *d* as follows.

Upon the rear end of the shaft *m*, (to which the cam *l* is secured) is a hooked arm *p*, Fig. 2, the hooked end of which engages with the studs or teeth of a wheel *q*, Figs. 2 and 4. When the drop-lever catch *n n* falls it will be seen by inspection of the drawings, that the hooked arm *p* will move the wheel *q* one tooth, and thereby through the bevel gears *e e*, Fig. 4, turn the drum *d* and wind up its cord and weight. This winding up movement takes place every time the drop-lever catch falls, which is every minute. Thus it will be seen that the drop-lever catch by its downward movement not only allows the minute hand to move one minute at a time, and one only, by disengaging the escapement *k* and then holding the wheel by the escapement *i*, but also

effects the winding up of the cord and weight every minute, that drives the pendulum. The drop-lever catch is elevated again so as to engage with the teeth of the ratchet wheel, and also brings the escapement k into the teeth of the wheel f (thereby locking said wheel) by changing the position of the cam l by means of a counterpoise r which is of sufficient weight to carry the drop-lever catch back to its original position. The escapement k when the cam l is turned back to its original position is made to enter the teeth of the wheel f by traveling up a curved guide s , Fig. 1. The cord upon the drum h for carrying the wheel f that gives motion to the hands, is wound up every hour by the striking movement as follows. To the drum h is attached a ratchet wheel t , which is turned two teeth or notches at a time (being thirteen teeth in all, by a lever pawl u attached to an arm v on the rocker shaft w . This rocker shaft is actuated by means of an escapement the pallets x of which are attached to different points of the circular disks y , Fig. 1. The pallets x are driven so as to carry the rocker shaft w by the wheel z , the drum a' of which is turned by a cord and weight. The pallets x are alternately engaged with, and disengaged from the teeth of the wheel z , so as to drive the rocker shaft, first in one direction and then in the opposite one by means of the curved inclined plane b' , b' . By the movement thus given to the rocker shaft w , the lever pawl u before referred to is made to turn the ratchet wheel t and consequently the drum h , thereby winding up the cord and weight for carrying the hands every hour or every time the clock strikes. The striking movement is locked and unlocked at the proper time and so as to strike the required hour by any of the devices commonly employed in clocks for the same purpose.

The hammer r' is sustained and balanced by two arms s' , t' and driven by means of the rod w' attached to the arm v , before referred to, at one end, and to an arm x' at the other. The arm x' is attached to the rocker shaft y' to which the arm t' is also attached. Thus it will be seen that the hammer r' is so completely balanced that but very little power will be required to drive it. The manner in which it is moved by the action of the rocker shaft w and arm

v &c., will be readily understood by inspection of Fig. 1.

The hour-hand is moved once an hour in a simple and efficacious manner as follows: An eccentric m' , Fig. 6, is attached to the shaft g of the wheel f and gives an eccentric motion to a toothed or notched wheel n' , Fig. 7, having eleven teeth, that actuates the three armed wheel o' by its teeth as it revolves, acting upon the pins p' , p' , p' shown by dotted lines in Fig. 7, thereby giving a rotary motion to the wheel o' . A hollow sleeve q' forms a part of the wheel o and fits loosely over the shaft g of wheel f' . To this sleeve the hour hand is attached and consequently makes one revolution to twelve of the shaft or minute hand.

Having thus described my improvements, I shall state my claims as follows:

What I claim as my invention and desire to have secured to me by Letters Patent is—

1. Winding up and renewing the motive power at regular intervals for keeping the pendulum in motion, so as to supersede the necessity of winding up by hand, and so as to drive the pendulum independently of the other movements of the clock, by the arrangement of devices herein described or their equivalents.

2. I claim winding up the cord and weight that drives the pendulum, by means of the drop-lever catch or its equivalent operating, by its downward movement, upon the hooked arm and thereby turning the drum upon which the cord is wound, substantially as described.

3. I claim the arrangement of devices for winding up every hour the cord and weight whereby the hands are kept in motion, in combination with the drop-lever catch, whereby the escapements are operated in such a manner as to give an intermittent rotary motion to the wheel for carrying the hands and prevent its moving more than one tooth at a time.

4. And in combination with the foregoing, I claim the means employed for carrying the hour-hand, the same consisting of the notched or toothed wheel, moving eccentrically and imparting the necessary motion to the wheel o' , as set forth.

AARON D. CRANE.

Witnesses:

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