(Model.)

4 Sheets—Sheet 1.

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CLOCK.

No. 492,813. Patented Mar. 7, 1893.

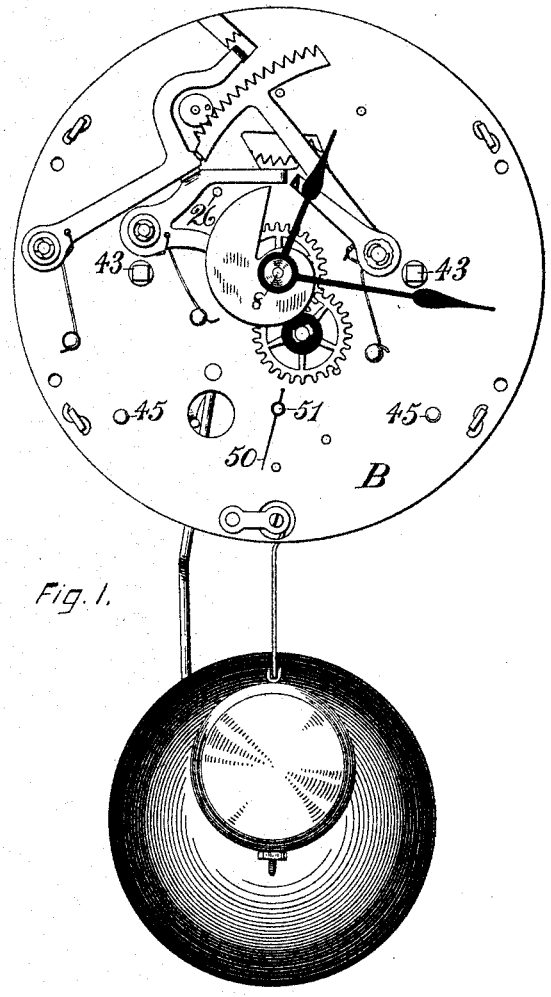

Fig. 1.

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Atty.

(Model.)

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Fig. 2.

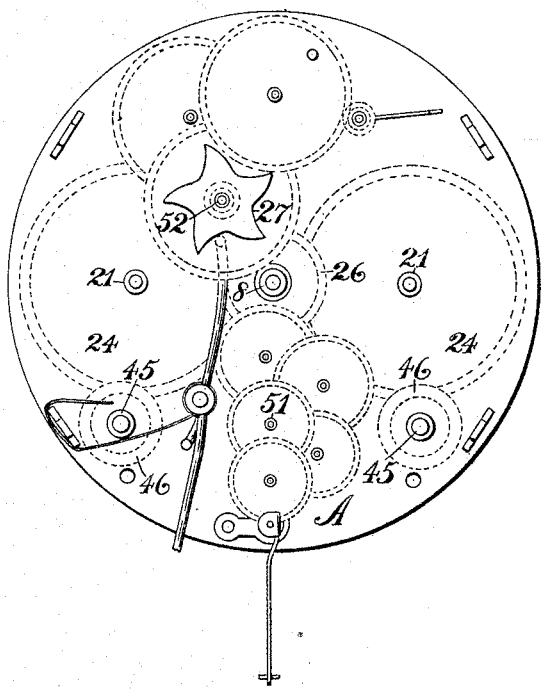

Fig. 3.

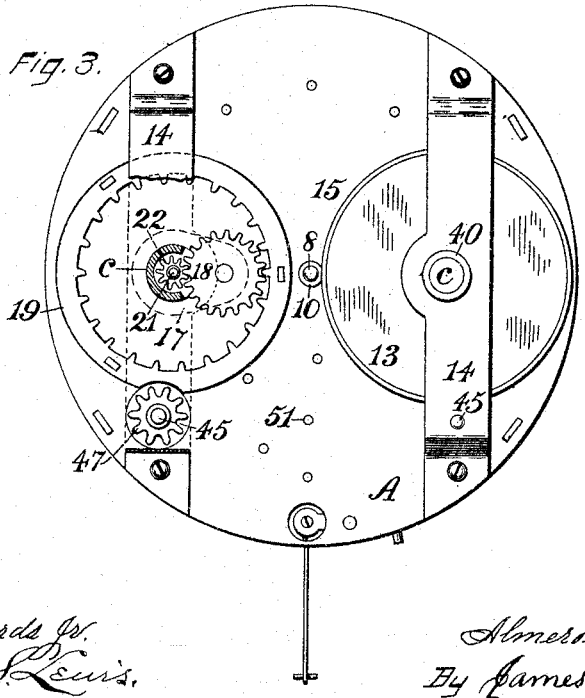

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Fig. 4.

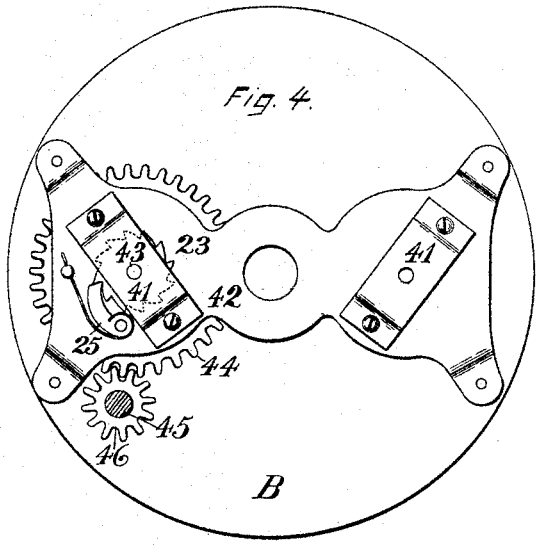

Fig. 5.

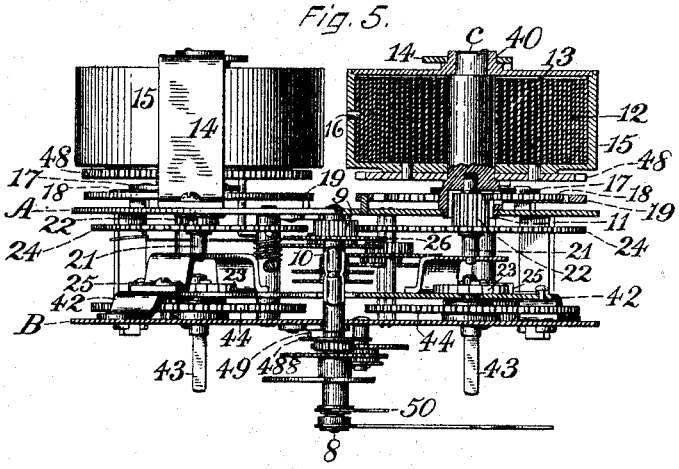

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Fig. 6.

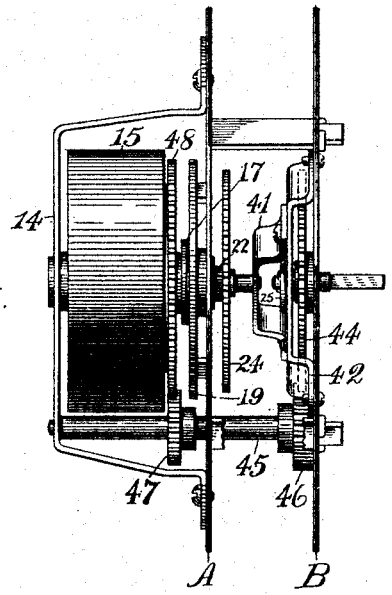


Fig. 7.

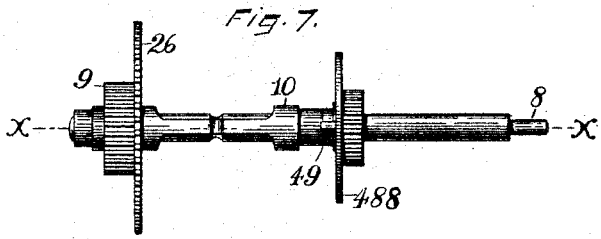
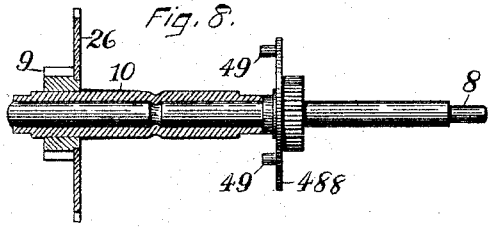


Fig. 8.



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UNITED STATES PATENT OFFICE.

ALMERON M. LANE, OF MERIDEN, CONNECTICUT.

CLOCK.

SPECIFICATION forming part of Letters Patent No. 492,813, dated March 7, 1893.

Application filed June 15, 1892. Serial No. 436,884. (Model.)

To all whom it may concern:

Be it known that I, ALMERON M. LANE, a citizen of the United States, residing at Meriden, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Clocks, of which the following is a specification.

My invention relates to improvements in clocks having an internal rack and planet wheel and the objects of my improvement are general efficiency of the clock and simplicity and economy in construction, whereby I employ said rack and planet wheel in connection with a striking clock.

In the accompanying drawings—Figure 1 is a front elevation of my clock without the dial. Fig. 2 is a front elevation of the major portion of the time and strike trains thereof, the front movement plate and connected parts being removed. Fig. 3 is a rear elevation of my clock with one of the main springs and its barrel removed while other parts are shown in section and in broken lines. Fig. 4 is a rear view of the front movement plate and bridges, with one of the winding wheels, pinions, ratchets and pawls, and a transverse section of the pinion shaft. Fig. 5 is a partial horizontal section and partial plan view of my clock movement. Fig. 6 is a side elevation of some of the principal parts, one of the pillars being partially broken away. Fig. 7 is a detached side elevation of the center shaft on an enlarged scale, and—Fig. 8 is a similar view with the friction sleeve in horizontal section on the line *x x* of Fig. 7.

A designates the rear movement plate and B the front plate, between which plates the major part of the time and striking trains and mechanisms are mounted, which in their general features are of ordinary construction and for which equivalent devices may be substituted.

8 designates the center or pointer carrying shaft, having the pinion 9 mounted thereon and made to rotate therewith by means of the friction sleeve 10 in any ordinary manner, the same being in effect like the center shaft ordinarily employed in clocks that do not have the internal rack. At each side of this center shaft the rear movement plate is provided with a large round hole that receives the tenon 11 on the front end of the main spring hub *c*, to which hub the inner end of the main spring 12 is secured by means of a pin or hook 13 in any ordinary manner. This hub *c* is supported at its rear outer end by the hub 40 of the spring barrel cap, said hub 40 being supported by the bridge 14. The outer end of the bridge is secured to the spring barrel 15 at 16 Fig. 5. The main spring hub *c* passes through the base of the spring barrel 15 while its outer end is journaled in the spring barrel cap as before stated so that said hub may rotate within said barrel and said barrel may rotate on said hub.

The hub *c* in addition to carrying the inner end of the main spring is provided with an arm 17 whose contour is indicated by broken lines in Fig. 3 and on which the planet wheel 18 is mounted. A stationary internally toothed rack 19 is secured by any suitable means, as for instance short lugs or posts, to the rear plate, concentrically with the hub *c* and with the planet wheel 18 engaging its teeth. The hub *c* is bored axially to form a bearing for one end of the shaft 21 and is also counterbored so as to receive into it one end of the pinion 22 that is rigidly mounted on or made fast to said shaft, which pinion engages with and is driven by the planet wheel 18, a slot being made on one side of the hub *c* to admit one edge of said planet wheel as shown in Figs. 3 and 5. The front end of the shaft 21 has its bearing in the sub bridge 41 on the winding wheel bridge 42 that is secured to the back side of the front movement plate B. The first or main wheel 24 is mounted on the same shaft 21 as the pinion 22 and rotates therewith.

Between the winding bridge 42 and the front plate I mount the winding wheel 44 on the winding arbor 43 concentrically to the main spring hub and barrel, the ordinary squared end of said winding arbor projecting through the front plate for the application of an ordinary winding key. On the winding arbor I also mount at the rear of the winding bridge the ratchet wheel 23 and the spring pressed pawl 25. A pinion shaft 45 has one end mounted in the front movement plate B and its rear end in the spring barrel bridge

14. On this shaft are two pinions one of which 46 engages with the teeth of the front winding wheel 44 while the other pinion 47 engages a rear winding wheel 48 which is rigidly secured to and rotates with the spring barrel the same as if the two were one and the same piece, whereby turning the winding arbor rotates the spring barrel to wind up the main spring from its outer end.

As before implied there are two main spring hubs with connected winding and driving mechanism, one upon each side of the clock, the first or main wheel 24 on the time side of the clock being engaged with and driving the pinion 9 of the shaft 8 which shaft also carries a wheel 26 and the rest of the time train that leads from said pinions. On the strike side of the clock, the left hand side in Figs. 1, 2 and 5, the first or main wheel 24 engages with and drives the pinion at the rear end of the shaft 52 which also carries the hammer lifting device 27 Fig. 2 and from which shaft the balance of the clock striking mechanism extends. The lock work of the striking side may be of any ordinary construction. That which I have illustrated is of the class known as a rack and shaft strike.

It should be noticed that all of the wheels of the train on the striking side except the stationary rack and planet wheel are between the front and rear movement plates, that is to say the first or main wheel 24, the pinion at the rear end of the shaft 52 which is engaged by said wheel and the other shafts, bearing wheels and pinions leading to and including the ordinary fly wheel or fan are all between said plates and these parts I designate as the major portion of the striking train.

The disk 48 which bears the trip pin or pins 49 (there are two of such pins in a clock for striking the half hour) is mounted on the center shaft 8 in front of the front movement plate B, but this is not essential to my present invention.

The bridge 14 in which the hubs of the spring barrels are mounted are attachable to and detachable from the rear of the rear movement plate by means of screws so that both main springs may be detached for repairs or cleaning without disturbing the movement plates. It may also be noted that I employ a second hand 50 which beats half seconds, the same being mounted on the second hand shaft 51.

The internal rack and planet wheel when considered by themselves, are the same as heretofore and need not be specifically described; but I believe in former constructions the center shaft which carries or drives the pointers has been mounted concentrically with the internal rack, and was therefore provided with a wheel loosely mounted thereon in connection with a ratchet and pawl. By my invention I dispense with a ratchet on the center shaft and I mount said center shaft eccentrically to the internal rack, while the pinion and wheel that are driven by the planet-wheel are both rigidly mounted on their shaft. I am also enabled to apply the internal rack and planet wheel to both the time and strike sides of the clock. I not only make a very compact movement for a striking clock, but I am enabled to make an eight day clock with such main springs as have heretofore been employed in thirty-hour clocks. Of course my improvement may be applied to a thirty-hour clock if desired and to either a pendulum or marine clock. Although the planet wheel and internally toothed rack are on the back of the clock the winding arbor is on the front, and said rack and planet wheel are so arranged on both the strike and time sides of the clock that the power of the main spring is not suspended during the winding operation.

In the act of winding, the winding arbor carries the winding wheel 44 and the ratchet 23 while the pawl 25 prevents a backward movement of said arbor. The winding wheel drives the pinion 46 and its shaft 45 thereby moving the pinion 47 which engages with and drives the gear 48 and attached spring barrel, winding the main spring from its outer end, said spring barrel then rotating on the spring hub *c* and consequently there is no reverse or backward movement of the planet wheel. The main spring constantly acts to revolve the hub *c* and planet wheel 18 thereby driving the pinion 22 and rigidly connected wheel 24, while the spring barrel remains stationary, and also while it is being wound.

I have shown and described what I believe to be the best mode of applying my invention in all of its parts but it will of course be evident that the parts or combinations pointed out in any one of the several claims are not necessarily dependent upon the specific construction of those parts which are not particularly pointed out in the same claim.

I claim as my invention—

1. A clock having an internal rack and planet wheel and the pointer carrying center shaft mounted eccentrically to said rack, substantially as described and for the purpose specified.

2. The combination with an internal rack and planet wheel with the shaft 21 concentric with said rack, the pinion 22 driven by said planet wheel and made fast on said shaft 21, the wheel 24 also made fast on said shaft 21 and the rest of the train driven by said wheel 24, substantially as described and for the purpose specified.

3. The combination of a main spring, the spring hub having the inner end of said main spring secured thereto, the planet wheel also carried by said hub, the internal rack, the pinion 22 concentric with said rack, the main spring barrel mounted to rotate on said hub and having the outer end of said spring secured to it, and means for turning said spring barrel to wind up the spring, whereby the

power transmitted through said planet wheel is not withdrawn during the winding operation as specified.

4. The combination of the main spring hub having a hollow tenon at one end for its pivotal bearing, a spring barrel fitted to rotate on said hub and having a hollow hub for the pivotal bearing of one side of said barrel and that end of said main spring hub which is opposite said hollow tenon. an internal rack, a planet wheel mounted on said hub. a main shaft journaled in the hollow tenon of said hub, a pinion on said shaft engaging said planet wheel and the remainder of a train driven by said main shaft, substantially as described and for the purpose specified.

5. A clock having an internal rack and planet wheel with their driving mechanism, a driven train on the front side of said wheel leading therefrom to the last wheel of said train and the pawl and ratchet of its winding devices on the opposite or back side of said planet wheel substantially as described and for the purpose specified.

6. A clock having an internal rack, planet wheel, main spring arbor and main spring at the rear, a winding arbor at the front separate from said main spring arbor and connecting devices between said winding and main spring arbors, substantially as described and for the purpose specified.

7. A clock having an internal rack, planet wheel, main spring and winding wheel at the rear; a winding arbor and wheel mounted in the front plate and a pinion shaft and pinions connecting said front and rear winding wheels, substantially as described and for the purpose specified.

8. A clock having the attachable and detachable bridge 14 secured to the rear of its rear movement plate, the main spring hub, planet wheel, and main spring mounted between said bridge and plate, the pinion 22 with one end of its shaft mounted in said hub and the remainder of the train mounted in front of said rear plate, substantially as described and for the purpose specified.

ALMERON M. LANE.

Witnesses:
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BRAYTON S. LEWIS.