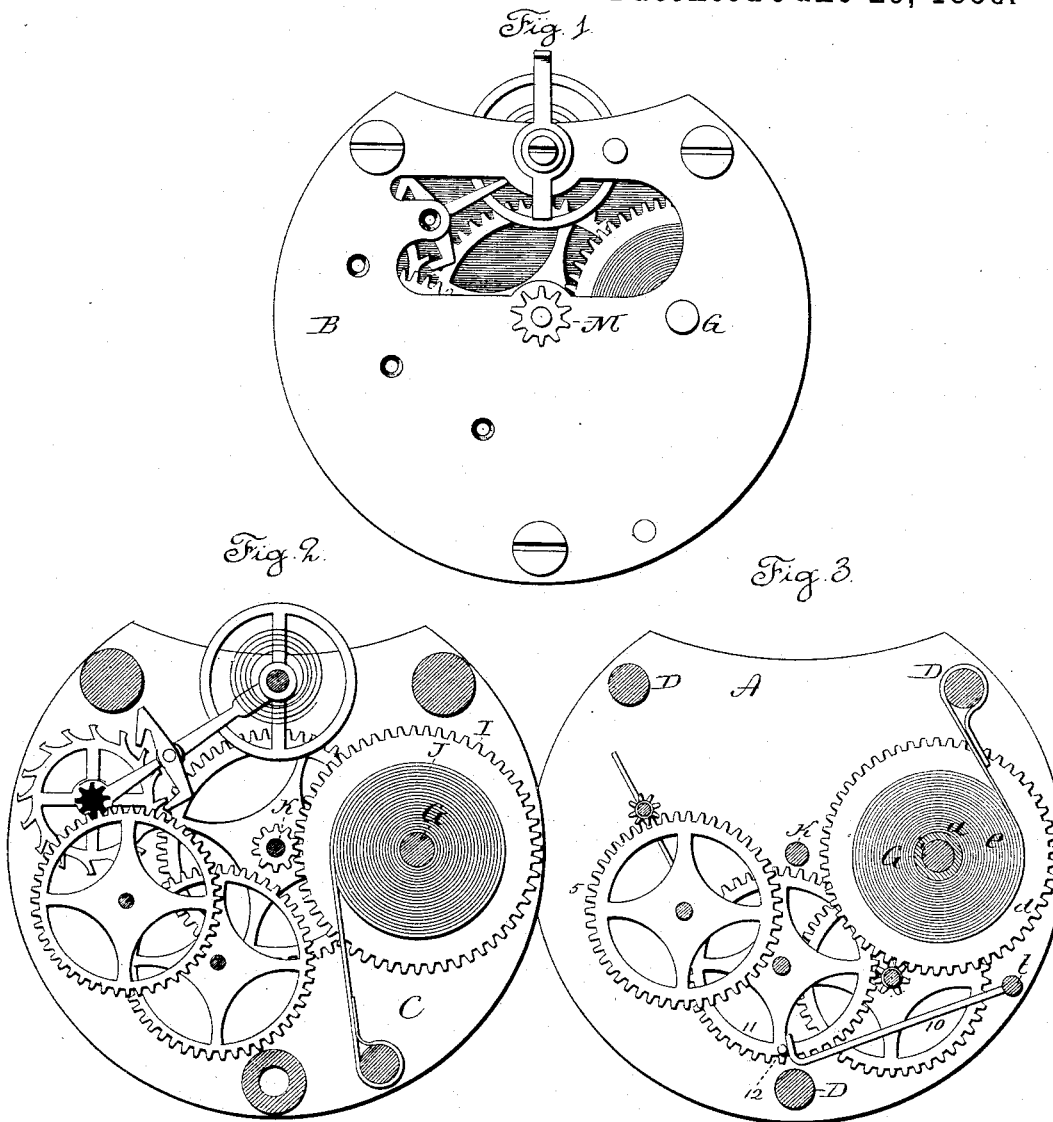


F. A. LANE.
CLOCK MOVEMENT.

No. 344,584.

Patented June 29, 1886.



Witnesses.
J. H. Shumway
Frederic C. Earle

Fred. A. Lane
Inventor.
By Atty.
Frederic C. Earle

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Fig. 4.

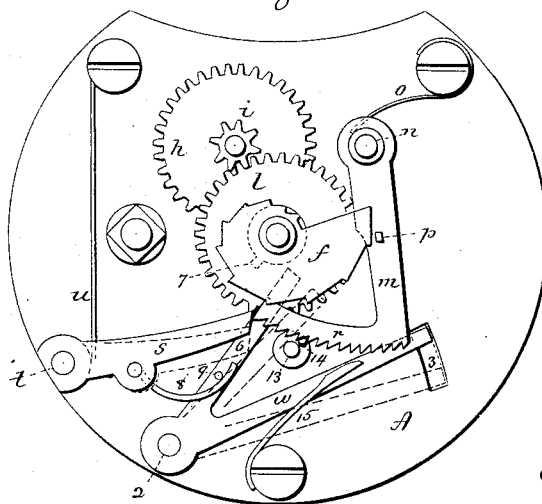


Fig. 6.

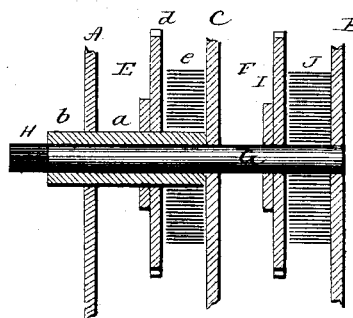


Fig. 5.

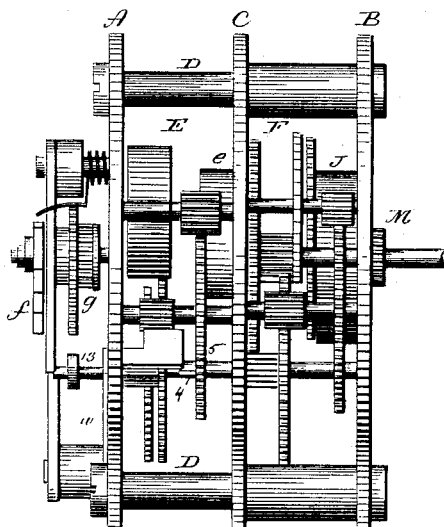
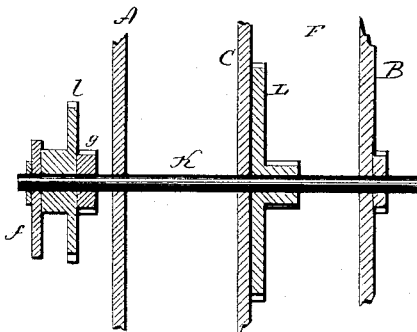


Fig. 7.



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UNITED STATES PATENT OFFICE.

FRED. A. LANE, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE NEW HAVEN CLOCK COMPANY, OF SAME PLACE.

CLOCK-MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 344,534, dated June 29, 1886.

Application filed April 5, 1886. Serial No. 197,759. (Model.)

To all whom it may concern:

Be it known that I, FRED. A. LANE, of New Haven, in the county of New Haven and State of Connecticut, have invented new Improvements in Clock-Movements; and I do hereby declare the following, when taken in connection with 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 front view of the movement, the pointer-wheels, except the center pinion, removed; Fig. 2, a transverse section cutting just in rear of the front plate and looking rearward; Fig. 3, a transverse section cutting just in rear of the intermediate plate, looking rearward and showing the strike main wheel and train; Fig. 4, a rear view showing the count mechanism outside the rear plate; Fig. 5, a side view looking from the left of Fig. 1; Fig. 6, a partial longitudinal section cutting through the main arbor and the main wheels; Fig. 7, a partial longitudinal section cutting through the center arbor.

This invention relates to an improvement in that class of clocks in which the time and striking mechanism are included in a single apparatus, the object of the invention being to bring the mechanism into a very contracted space, and adapted to the smaller classes of case; and the invention consists in a frame composed of three plates supported and connected in planes parallel with each other, the intermediate plate forming a central division in the frame, the time-train in one division, the striking-train in the other division, the main arbor extending through the two divisions from front to rear, terminating at one end in a winding-stem, a sleeve on said main arbor extending from one of the divisions outside the frame, and terminating in a winding-stem substantially concentric with the winding-stem of the main arbor, the main arbor and sleeve carrying, respectively, the main wheels of the time and strike movements, and in the divisions in which the respective trains are arranged, and as more fully hereinafter described.

A represents the rear plate of the frame, B the front plate, and C the intermediate plate. The three plates are arranged parallel with

each other and connected by posts D, and so as to form two divisions, E F, in the frame, the one in front of the other, as seen in Fig. 5.

G is the main arbor, which takes a bearing in the front plate, B, and extends through the intermediate plate, C, and through the rear plate, A, terminating at the rear in a winding-stem, H. On the main arbor the main wheel I is arranged between the front and intermediate plate and in the division F of the frame. In connection with this main wheel I is the mainspring J, the connection being made in the usual manner for clock mainsprings, a device too well known to require description or illustration, and so that by applying a key to the winding-stem the spring may be wound, and the reaction of the spring will impart driving rotation to the arbor G and the main wheel I. The time-train is arranged entirely in the front division, F, between the plates B C, as seen in Figs. 2 and 5.

K is the center arbor, which extends through the three plates, as seen in Fig. 7, from front to rear, and on which arbor the center wheel, L, is arranged in the usual manner, to impart rotation to the center arbor, and on this arbor, outside the front plate, the pointer-pinion M is arranged, also in the usual manner, and as seen in Figs. 1 and 5, the usual pointer-wheels being applied in connection with the said wheel M in the usual manner, and whereby the pointers will be driven. This gearing is too well understood to require illustration or further description.

On the main arbor G, and in the rear division of the frame, a sleeve, a, is arranged, which extends rearward through the plate A and terminates in the winding-stem b, around the stem H, and so that a key may be applied to the stem b to turn the sleeve a, the main arbor forming an axis for such turning or rotation of the sleeve a. The stem H projects outside the stem b, so that a key may be applied to either.

On the sleeve a is the main wheel d and the mainspring e, coupled in the usual manner for the mainspring, the main wheel, and arbor of a clock-movement, and so that by turning the sleeve a the spring e will be wound, and the reaction of the spring will impart driving rotation to the main wheel d.

The strike-train is arranged between the

rear plate, A, and the center plate, C, in the division E, as seen in Figs. 3 and 5, and receives motion from the main wheel *d*.

In rear of the plate A, and on the center arbor, K, the snail *f* is arranged, so as to turn freely thereon, and to which one revolution is imparted once in twenty-four hours from a pinion, *g*, on the center arbor, working into a gear, *h*, which carries a pinion, *i*, the said pinion working into a gear, *l*, on the hub of the snail *f*. The snail consists of a series of twelve offsets corresponding to the twelve hours of the day. Adjacent to the snail *f* the count-lever *m* is hung upon a pivot, *n*, provided with a spring, *o*, the tendency of which is to force the lever *m* toward the snail, and on the lever *m* is a stud, *p*, adapted to rest upon the periphery of the snail *f*, and so that the stud *p* may be brought to a bearing upon either of the offsets of the snail, accordingly as it is presented. The count-lever *m* is provided with a toothed rack, *r*, concentric with the pivot *n* of the lever, and provided with the usual twelve teeth or notches. *s* is the count-pawl, hung upon an arbor, *t*, and forced toward the snail by a spring, *u*.

w is one arm of the trip-lever hung upon a pivot, 2. The free end of the lever *w* turns inward through a slot, 3, in the plate, and so as to catch upon a stud, 4, projecting from the wheel 5 of the strike-train when the lever *w* is in a certain position, but escape at other times. The second arm, 6, of the trip-lever extends inward and into the path of a stud, 7, on the center arbor, (indicated in broken lines, Fig. 4,) and so that at each hour the trip-lever will be turned, as indicated in broken lines, Fig. 4. The pawl *s* is held in a position, as seen in Fig. 4, so that the nose or end of the rack *r* rests thereon in the normal position of the parts; but as the trip-lever *w* 6 is turned, as before described, the pawl *s* is turned away from the rack, as seen in broken lines, Fig. 4, because of an engagement between the trip-lever and the pawl, here represented as made by an arm, 8, extending from the pawl, and against which a stud, 9, on the arm 6 bears, as indicated in Fig. 4.

From the arbor *t* a lever, 10, extends toward the third wheel, 11, of the strike-train, as seen in Fig. 3, against the end of which a stud, 12, on the said wheel 11 will bear when the parts are in their normal position, (seen in Fig. 4;) but when the pawl *s* is turned away, as before described, and shown in broken lines, Fig. 4, the lever 10 will also be turned away from the stud 12 and out of its path, so that the strike-train in that position will be free to run.

On the end of the arbor 13 of the wheel 11, and which extends through the rear plate, A, is an eccentric stud, 14, adapted to work into the teeth of the rack *r*, and so that if the arbor 13 be permitted rotation, each rotation will bring the stud 14 into engagement with a tooth of the rack *r*, and so as to impart a single step movement to said rack.

When the parts are in motion, and as the end of the hour approaches, the cam 7 on the center arbor will strike the arm 6 of the trip-lever and gradually turn that arm outward or away from the center, and at five minutes before the hour the lever will have been so far turned as to have also turned the pawl *s* to such an extent that the stud 12 on the wheel 11 may escape from the lever 10 and permit the strike-train to start, but not to a sufficient extent to take the end of the arm *w* out of the path of the stud 4 on the wheel 5; hence the train will be again arrested so soon as the stud 4 comes against the end of the arm *w*. This slight movement of the train produces what is commonly called "the warning," but this movement of the pawl *s* is not sufficient to permit the end of the rack *r* to escape from the nose of the pawl. As the hour is completed the action of the cam 7 on the lever 6 is sufficient to turn the pawl *s*, as indicated in broken lines, Fig. 4, so as to permit the rack *r* to escape. Then, under the action of the spring *o*, the rack will be thrown inward and toward the snail until the stud *p* comes to a bearing on the offset which may be at that time presented—say, if it be six o'clock, the movement of the lever over the nose of the pawl will be six teeth. While in this position the pawl is prevented from returning to its full extent, and hence prevents the lever 10 from again engaging the wheel 11 to stop the strike-train, consequently the strike-train will continue to run, and at each revolution of the arbor 13 the rack will be thrown outward one tooth and caught by the pawl *s*, and soon, until the rack has passed entirely from the nose of the pawl. Then the pawl escaping from the rack will return to its normal position and arrest the strike-train, as before described.

A spring, 15, is applied to the trip-lever, tending to throw it into its normal position.

The count mechanism which I have shown and described, broadly considered, is the common and well-known "snail" count. By this arrangement of the time-train its main wheel and spring in one division, and the strike-train, its main wheel, and spring in the second division of the frame, the arbors of the time-train having their bearing in the front and intermediate plate and the arbors of the strike-train having their bearing in the rear and intermediate plates, so that the respective trains, their respective main wheels and springs, while one directly in rear of the other, in no way interfere with each other, I am enabled to bring the movement into a very compact space, and so that I may produce a practical striking time-piece in a minimum space. This division of the frame into two parts and the arrangement of the main wheel and spring with the train of the one part in one division and the main wheel and mainspring with the other train in the other division, may be applied to alarm-movements as well as strike-movements. In this case what is represented as the strike-train main wheel and spring in

this application may be considered as the alarm main wheel and train.

I do not wish to be understood as claiming, broadly, a clock-frame made in two divisions, having the time-train in one division and the strike-train in the other, with a main wheel and a spring in each division, whereby each train receives its movement from its respective springs, as such, I am aware, broadly considered, is not new; but in such prior construction the winding of the spring for the strike-train was produced through the action of the mainspring of the time-train. I am not aware that a clock-movement has been produced before my invention consisting of a frame in two divisions with the time-train in one division and the strike-train in the other division, each train having a main wheel and a mainspring entirely independent of the other train or its main wheel and spring, and in which the arbors of the respective main wheels extend through the rear plate and each terminate in a winding-stem, and so that each mainspring, main wheel, and their respective trains are independent the one of the other.

I claim—

1. In a clock-movement consisting of two independent mainsprings and main wheels with corresponding trains, the frame composed of the rear plate, A, the front plate, B, and the intermediate plate, C, the said plates secured together and in planes parallel with each other, so as to form two divisions, E F, combined with the time-train, its mainspring and main wheel in one division, and a second mainspring and main wheel with train in the other division, the arbors of the one train taking their bearings in the front and intermediate plate, and the arbors of the second train taking their bearings in the intermediate and rear plate, the arbors of the respective main wheels extended through the rear plate and terminating in winding-stems outside the rear plate, substantially as described.

2. In a clock-movement substantially such as described, the frame composed of the rear plate, A, the front plate, B, and the intermediate plate, C, said plates secured together and in planes parallel with each other, so as to form two divisions, E F, combined with the time-train, its main wheel and mainspring in one division, the strike-train, its main wheel and mainspring in the other division, with the count mechanism upon the outside of the outer plate of the division in which the strike mechanism is arranged, substantially as described.

3. The herein-described time and strike clock-movement, consisting of a frame composed of the rear plate, A, the front plate, B, and the intermediate plate, C, the said plates secured together and in planes parallel with each other, so as to form two divisions, E F, combined with a single main arbor, G, extending through both divisions and projecting at one end to form a winding-stem, a main wheel and spring with their connections on the arbor in one division, a sleeve, *a*, arranged loose upon said main arbor in the other division and, extending outward therefrom, terminates in a winding-stem, *b*, around the main arbor, a main wheel and spring in connection with the said sleeve and in the said other division, a time-train in one division and in engagement with the main wheel in that division, the strike-train in the other division and in engagement with the main wheel in that division, and with the count mechanism arranged upon the outside of the outer plate of the division in which the strike mechanism is arranged, substantially as described.

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Witnesses:

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