(Model.) 3 Sheets—Sheet 1.

C. S. LEWIS.

TIME PIECE.

No. 312,479. Patented Feb. 17, 1885.

Fig. 3.

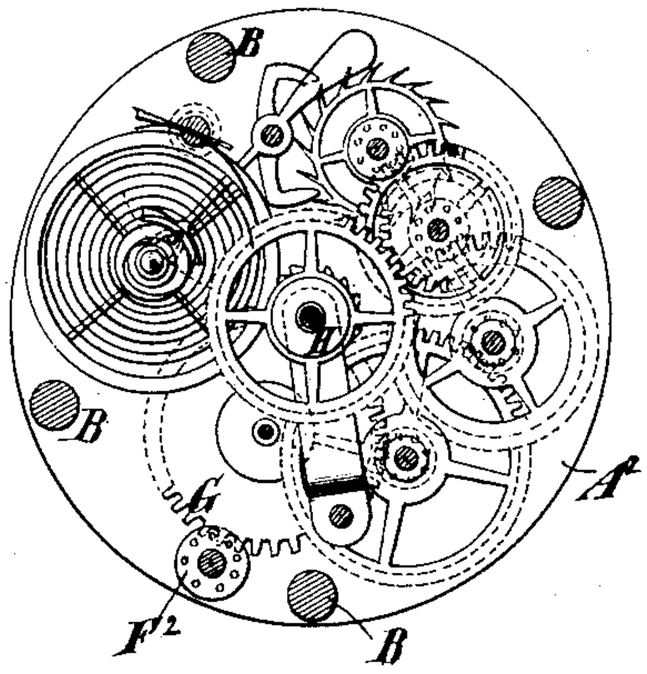


Fig. 1.

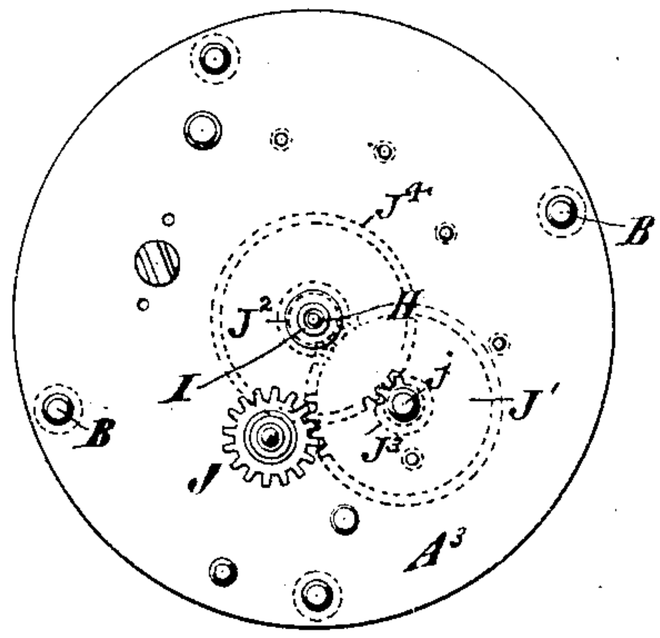


Fig. 2.

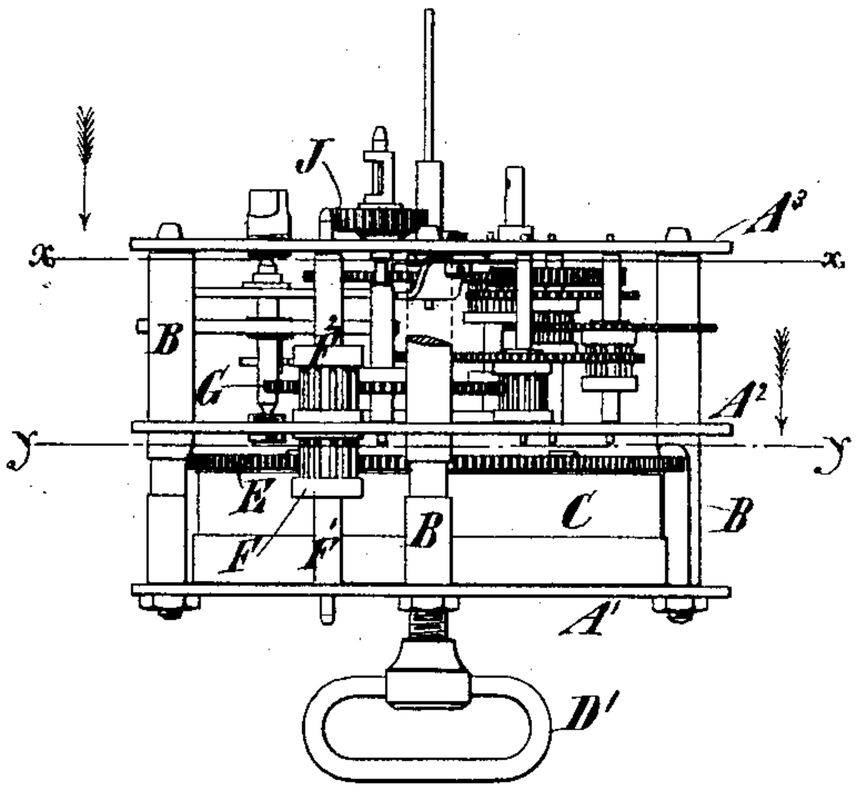
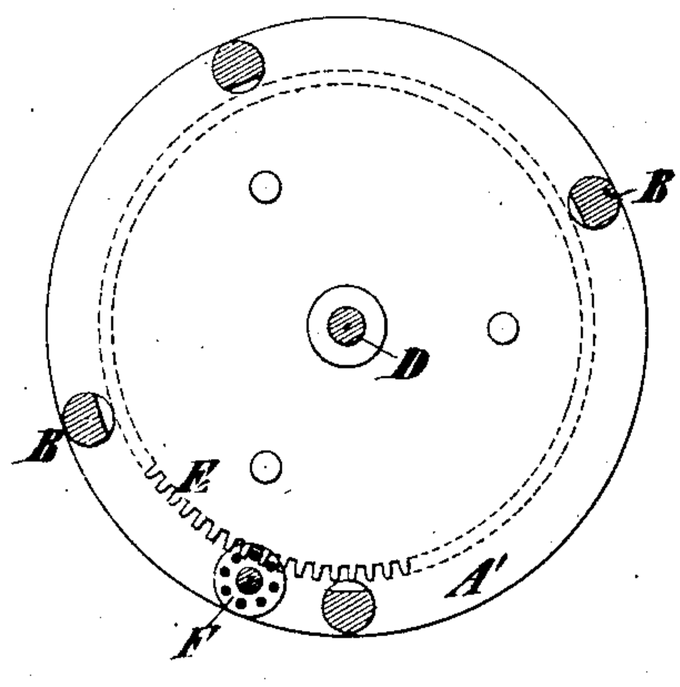


Fig. 4.



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Inventor:-

Charles S. Lewis,
by his attorneys,
Gifford & Brown

(Model.) 3 Sheets—Sheet 2.

C. S. LEWIS.

TIME PIECE.

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Fig. 7.

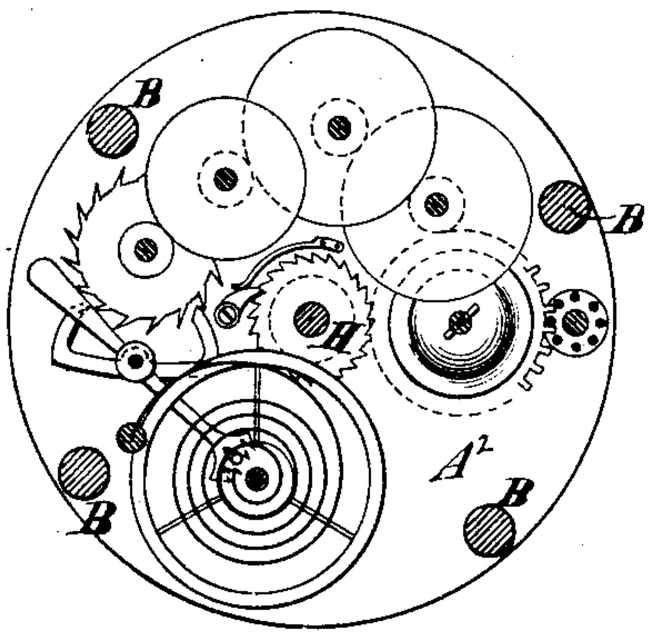


Fig. 5.

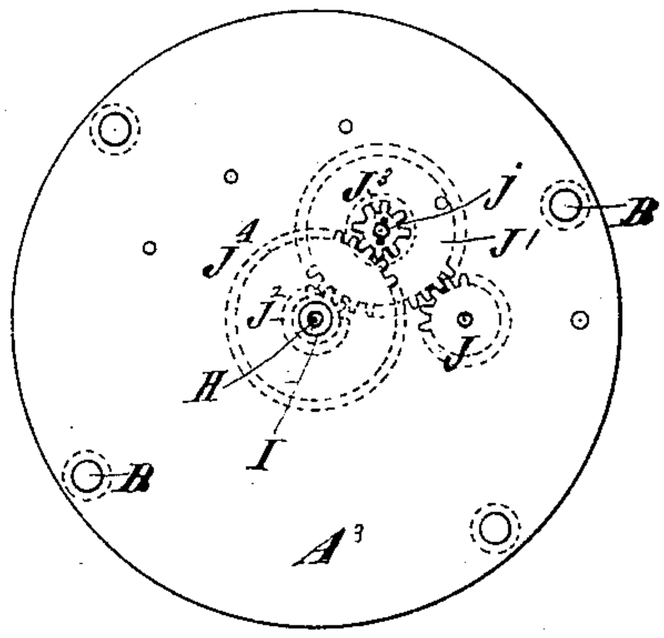


Fig. 6.

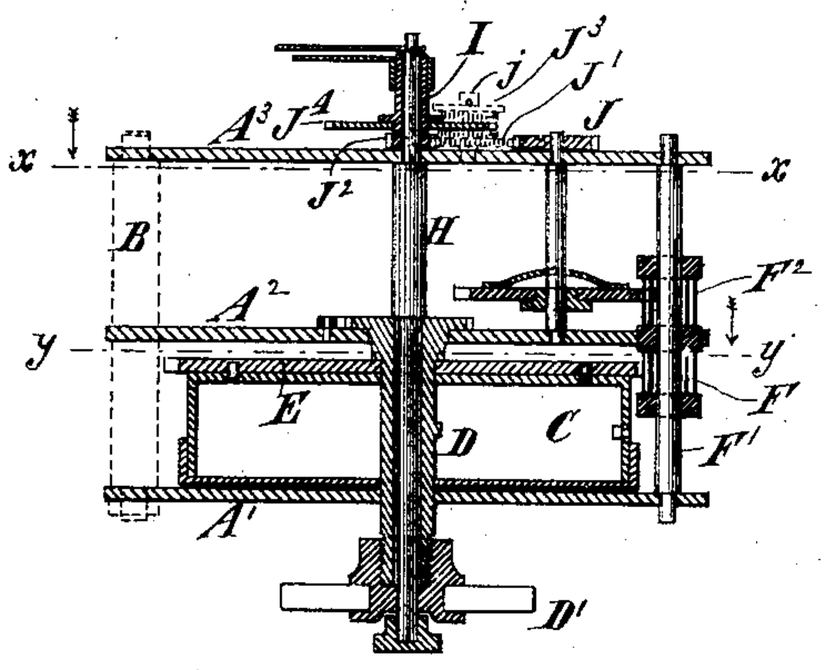
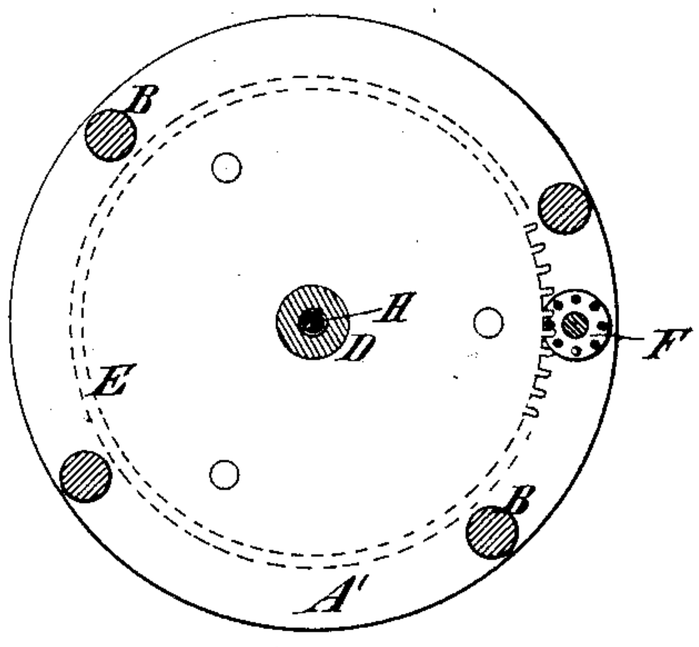


Fig. 8.



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(Model.)

3 Sheets—Sheet 3.

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Fig. 11.

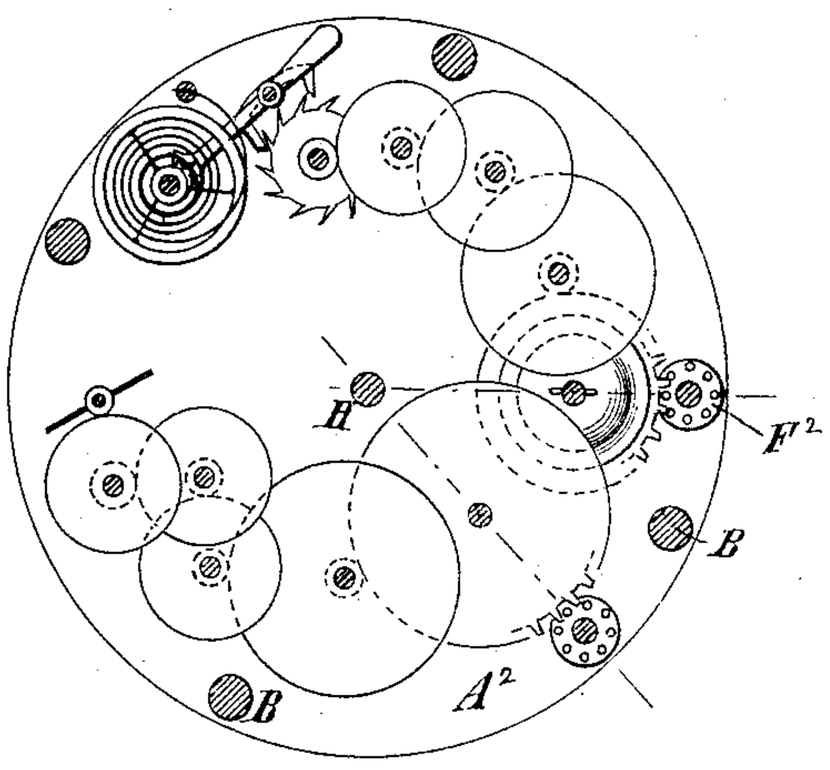


Fig. 9

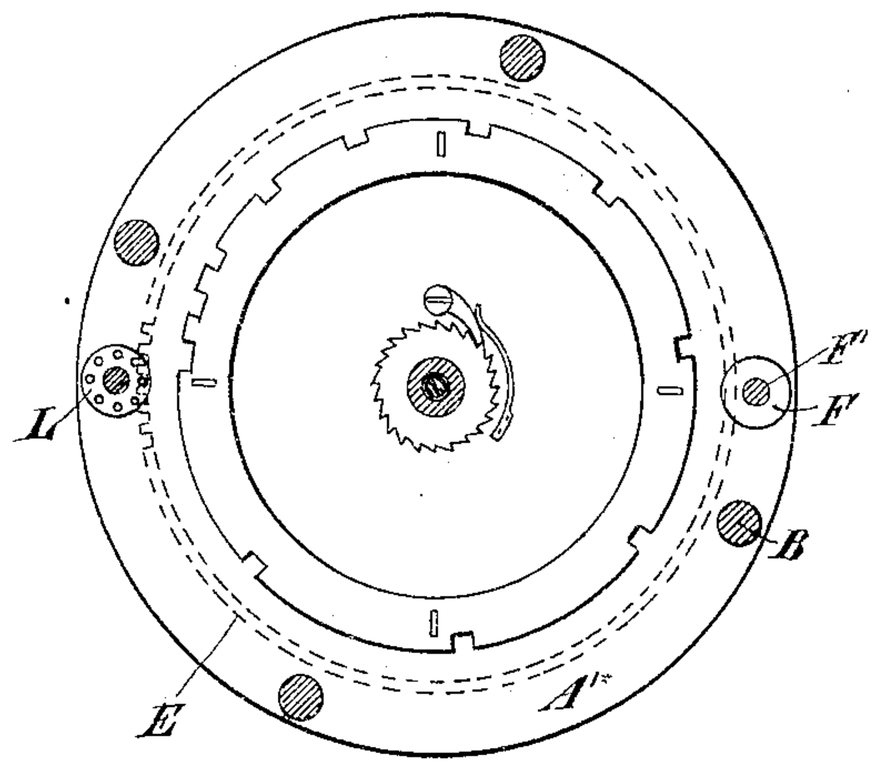
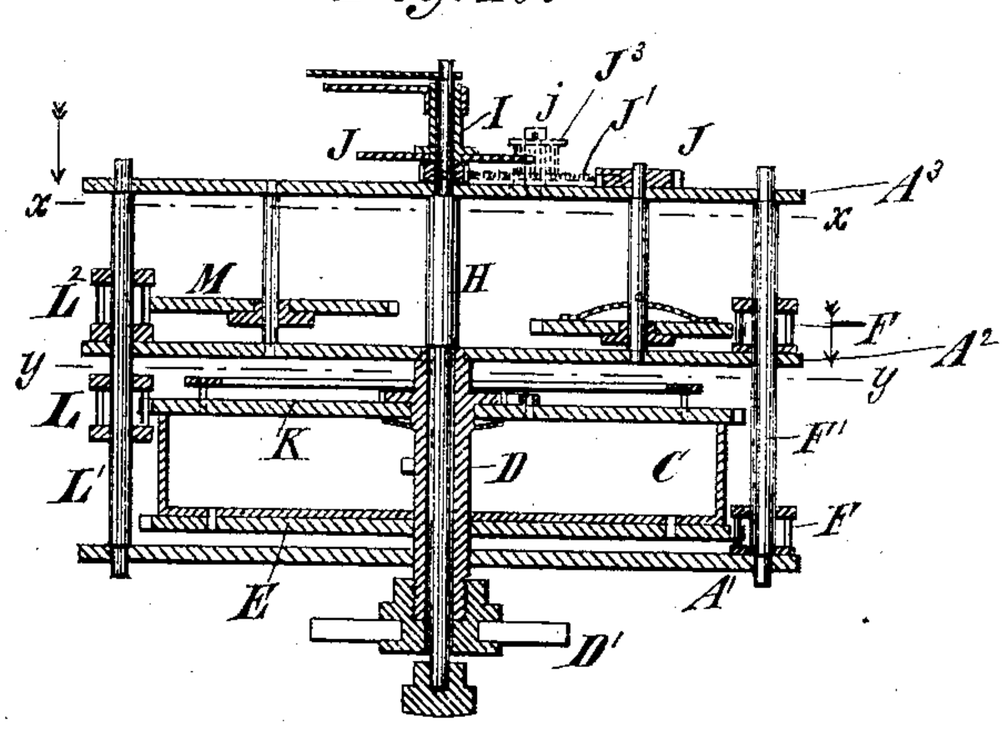


Fig. 10.



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F. J. Keane

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by his attorneys,
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UNITED STATES PATENT OFFICE.

CHARLES S. LEWIS, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE WATERBURY CLOCK COMPANY, OF SAME PLACE.

TIME-PIECE.

SPECIFICATION forming part of Letters Patent No. 312,479, dated February 17, 1885.

Application filed January 26, 1884. (Model.)

To all whom it may concern:

Be it known that I, CHARLES S. LEWIS, of Waterbury, in the county of New Haven and State of Connecticut, have invented a certain new and useful Improvement in Time-Pieces, of which the following is a specification.

The object of my improvement is to produce a time-piece which will be very compact, and yet will have space for a long spring.

In the accompanying drawings, Figure 1 is a view of a front of a time-piece embodying my improvement, the dial and hands being removed. This time-piece has no strike mechanism. Fig. 2 is a side view of the same time-piece, one of the posts of the frame being broken away. Fig. 3 is a section of the same, taken at the plane of the line *x x* in Fig. 2. Fig. 4 is a section thereof taken at the plane of the line *y y* in Fig. 2. Fig. 5 is a view of the front of another time-piece embodying the improvement, and lacking a strike mechanism, and having the dial and hands removed. Fig. 6 is a transverse section of the latter. Fig. 7 is a section taken at the line *x x*, Fig. 6. Fig. 8 is a section taken at the line *y y*, Fig. 6. Fig. 9 is a section of another time-piece embodying my improvement. This time-piece has a strike mechanism. Fig. 10 is a transverse section of this time-piece; and Fig. 11 is a section of the same on the line *x x*, Fig. 10.

Similar letters of reference designate corresponding parts in all the figures

I will first describe the time-piece which is shown in Figs. 1, 2, 3, and 4. The frame of the time-piece is composed of three disks or circular plates, $A' A^2 A^3$, connected by posts B.

C designates a barrel, which may be made of brass or other suitable material, in which is coiled a convolute spring. One end of the spring is fastened to the interior of the barrel, and the other end is fastened to a shaft or arbor, D. This barrel fits close to the front of the back plate, A′, and the shaft D extends through the back plate, A′, and the middle plate, A^2.

In rear of the back plate, A′, the shaft D is provided with a hand-piece D′, whereby it may be turned to wind up the spring. A key may obviously be employed for this purpose in lieu of this hand-piece.

In front of the middle plate, A^2, the shaft has affixed to it a ratchet-wheel with which engages a pawl pivoted to the middle plate, A^2, and actuated by a spring. The pawl and ratchet-wheel enable the shaft to be turned in one direction to wind the spring, and yet to hold the shaft against turning in the other direction. On the front of the barrel is a large gear-wheel, E, which is carried around with the barrel when the latter is rotated by the spring. This gear-wheel engages with a lantern-pinion, F, arranged upon a shaft, F′, between the back plate and middle plate. A lantern-pinion, F^2, is arranged on the shaft F′ between the middle plate, A^2, and the front plate, A^3. The shaft F′ is shown as journaled in bearings in the back plate and front plate. The two lantern-pinions are shown as formed together by running pins through three collets which are affixed to the shaft. Motion is transmitted from the lantern-pinion F^2 to a gear-wheel, G, whose shaft is journaled between the middle plate, A^2, and front plate, A^3. Motion is thence transmitted through other gearing to the hour and minute hand arbors. This gearing is principally arranged between the middle plate and the front plate, although part of it, which is termed the "dial-work," is arranged on the outside of the front plate. It will be observed that the shaft F′ and the lantern-pinions are arranged as close to the edges of the plates as is possible without having the lantern-pinions extend beyond the plates. This is done in order that the gear-wheel E and the spring-barrel may be made as large as possible.

It may be well to give a brief description of the dial-work. The wheel J is only friction-tight upon its shaft. This wheel gears into a wheel, J′, mounted on a stud, *j*, and the wheel J′ gears into a wheel, J^2, on the minute-hand arbor H. To the wheel J′ is affixed a small gear-wheel, J^3, that engages with a gear-wheel, J^4, on the hour-hand arbor I. The hour-hand arbor consists of a sleeve fitted loosely upon the minute-hand arbor. The wheel J is held on its shaft only by friction, in order to provide for setting the hands without turning all the wheels of the time-piece in so doing.

In the time-piece shown in Figs. 5, 6, 7, and 8 the shaft D is tubular, but otherwise is substantially the same as the shaft D of the time-

piece first described. The minute-hand arbor H in this example of my improvement extends back through the shaft D, and hence affords a means for setting the hands without taking hold of the hands, as is necessary in the time-piece first described. The wheel J is here represented as locked to its shaft, but the wheel from which said shaft derives motion is secured to the shaft by friction only; hence the effect is the same as that which is attained by securing the wheel J only by friction to its shaft, as shown in the time-piece first described.

The time-piece illustrated in Figs. 9, 10, and 11 has a strike mechanism as well as a time mechanism. The shaft of the wheel J is secured only by friction to the wheel from which it derives motion, and hence in this particular is identically like the time-piece which is illustrated by Figs. 5, 6, 7, and 8. The large gear-wheel E of the time mechanism is here arranged close to the back plate, A′, and consequently the lantern-pinions F F^2 of the time mechanism are not here arranged in close proximity, but are separated considerably, the pinion F being arranged close to the front of the back plate, A′, and the pinion F^2 being arranged close to the front of the middle plate, A^2. Owing to this separation of the pinions each of them has two collets. The shaft D is tubular in this example of my improvement, like that of the time-piece shown in Figs. 5, 6, 7, and 8, and the minute-hand arbor extends through it. On the shaft D is loosely mounted a large gear-wheel, K. A pawl pivoted to this gear-wheel and actuated by a spring engages with a ratchet-wheel affixed to the shaft. The spring inclosed in the barrel C, and fastened at one end to the barrel and at the other to the shaft D, imparts motion to both the barrel and the shaft. The shaft may be turned independently of the gear-wheel K for winding the spring, owing to the pawl-and-ratchet connection between the shaft and the said gear-wheel. The gear-wheel K engages with a lantern-pinion, L, mounted on a shaft, L′, on which is also mounted a lantern-pinion, L^2. The lantern-pinion L^2 is arranged between the middle plate, A^2, and the front plate, A^3, and transmits motion to a wheel, M, which forms part of a train of wheels included in the strike mechanism. I have arranged the train of time-wheels and the train of strike-wheels so that they extend in different directions.

It will be seen that by my invention I provide for using a very large spring-barrel without producing a cumbrous time-piece.

I do not wish to be confined to lantern-pinions in the places where I have shown such pinions used, for I may in lieu thereof use pinions of other construction.

I may use a frame-like holder, or a holder of any other suitable construction, for the spring in lieu of a barrel.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a time-piece, the combination of a frame comprising three plates rigidly secured together, a spring, a spring-barrel, said spring-barrel having its axis concentric with the centers of the plates, and being arranged between the back plate and center plate, a gear-wheel on said spring-barrel, a shaft arranged near the outer edges of said plates and bearing a pinion between the middle plate and back plate, engaging with said gear-wheel, another pinion on said shaft between the middle plate and front plate, engaging with a gear-wheel on a shaft located out of the center of the time-piece, and another gear-wheel on said last-mentioned shaft, actuating a gear-wheel for imparting motion to the hour-hand arbor, substantially as specified.

2. In a time-piece, the combination of a main shaft, a spring, a spring-barrel arranged loosely on said shaft, a gear-wheel forming one side of the barrel, a pinion engaging therewith and mounted on a primary shaft for a time mechanism, said time mechanism being arranged in front of the spring-barrel, a gear-wheel forming a cover for the spring-barrel affixed to the shaft first-named, and a pinion engaging with the gear-wheel last named and mounted on a primary shaft for a strike mechanism, said strike mechanism being arranged in front of the barrel, substantially as specified.

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Witnesses:
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A. BANNATYNE.