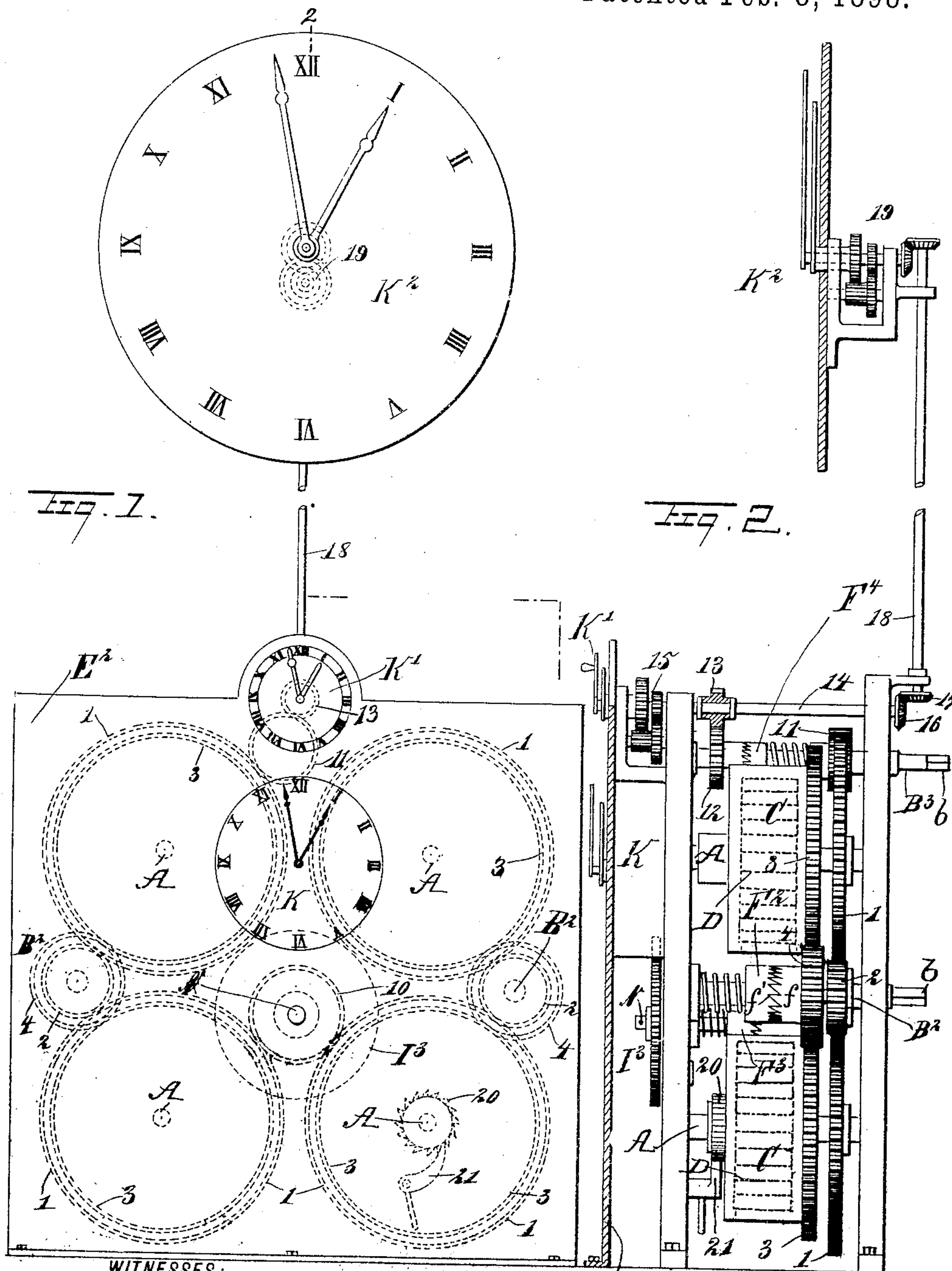


(No Model.)

S. B. WORTMANN.
CLOCK.

No. 598,589.

Patented Feb. 8, 1898.



WITNESSES:

H. Walker,
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BY

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UNITED STATES PATENT OFFICE.

SIGISMUND B. WORTMANN, OF NEW YORK, N. Y.

CLOCK.

SPECIFICATION forming part of Letters Patent No. 598,589, dated February 8, 1898.

Application filed May 2, 1896. Serial No. 589,968. (No model.)

To all whom it may concern:

Be it known that I, SIGISMUND B. WORTMANN, of New York city, in the county and State of New York, have invented new and useful Improvements in Clocks, of which the following is a full, clear, and exact description.

My invention relates to clocks, and has for its object to provide a simple driving mechanism for clocks, which will run with very little friction and take up a small space, whereby I am enabled to construct a clock which will run for one or several years without the necessity of any bulky mechanism, and at the same time the clock will be an accurate timekeeper. I also aim to provide by my invention a driving mechanism which may be readily connected to any ordinary clock, so that a clock constructed to run twenty-four or thirty-six hours only may be readily made to run for a year or more with one winding.

To secure the above-indicated results, I employ as a driving mechanism a spring-motor constructed substantially like the one described in several patents granted to me—for instance, Letters Patent No. 461,994, dated October 27, 1891. This motor I have for the purpose of my present invention modified by the addition of certain parts and the substitution of others, all as hereinafter particularly described and claimed.

In the accompanying drawings, Figure 1 is a front elevation of the improved clock, and Fig. 2 is a cross-section thereof substantially on the line 2 2 of Fig. 1.

As illustrated, the clock comprises a casing E^2 , in which are journaled the spring axles or shafts A and the two counter-shafts or winding-shafts B^2 , said winding-shafts having square ends b for the reception of a suitable key. On each spring-axle is loosely mounted a drum C , within which is arranged a spring D , one end thereof being secured to the axle and the other to the drum. Each drum also has rigidly secured to it a gear-wheel 3, and another gear-wheel 1 is rigidly mounted on the shaft A adjacent to the gear-wheel 3, said wheels being of different diameters or of different numbers of teeth. The gear-wheels 1 and 3, respectively, are in engagement with similar wheels 2 and 4, loosely mounted on

the counter-shafts, but rigidly connected with each other.

The gear-wheel 4 is formed with a hub f , 55 engaging serrations f' on a clutch F^2 , which is capable of sliding longitudinally on the shaft B^2 , yet held to turn therewith, for instance, by being keyed or feathered to the said shaft.

The wheels 1 of the two lower spring-drums 60 engage a pinion 10 on an approximately central shaft N . This shaft carries a clutch F^3 and a gear-wheel I^3 , which operates a clock K of any suitable construction. One of the 65 wheels of one of the upper drums—for instance, the wheel 1 thereof—engages a pinion 11, mounted on a counter-shaft B^3 , which is also a winding-shaft, said shaft carrying a clutch F^4 , constructed as hereinbefore de- 70 scribed with reference to the clutch F^2 , and another gear-wheel 12, which drives by means of a pinion 13 the shaft 14 of a clock K' . The shaft 14 is connected to one of the hands of the said clock, and the ordinary transmitting- 75 gear 15 is employed to drive the other hand of the clock at a different speed. On the shaft 14 is also secured a pinion 16, engaging a pinion 17 on a transmitting-shaft 18. Said 80 shaft is connected to a tower-clock K^2 , provided with the usual mechanism 19 for turning the hands at the requisite relative speed.

The clock K' serves only as a controlling-clock for the tower-clock K^2 , and the clutch F^4 is provided for the purpose of enabling the at- 85 tendant to turn the hands of the controlling-clock K' when it is desired to set the hands of the tower-clock K^2 , it being understood that the hands of the tower-clock will accurately follow any movement of the hands of 90 the controlling-clock K' .

One of the drums C or its axle may be provided with a ratchet-wheel 20, engaged by a pawl 21, so that the drums or axles may be held stationary while winding the springs, 95 and by the use of said pawl the springs may be wound much more quickly than when both the axle and the drum rotate during the winding operation, and the winding is performed only, owing to the differential speed of the 100 axle and the drum.

It will be understood that the shaft B^3 , as well as either of the shafts B^2 , may be used as a winding-shaft.

The operation of my improved clock will be obvious, particularly with reference to the description of the action of the motor as given in my former patents. The springs D
5 are wound by turning either the shaft B³ or one of the shafts B², and owing to the differential gearing formed by the wheels 1 2 3 4 the springs unwind very slowly and evenly, so that the clock will run a long time with
10 one winding and will not change its speed to any large extent. The clutch F² will permit the wheels 2 and 4 to become disconnected from the counter-shafts B² when the clock K is removed and the parts on the counter-
15 shafts, acquiring a high velocity and momentum, continue to rotate after the springs D have exhausted their driving power, thereby exposing said springs to injury or breakage if the clutch F² were omitted.
20 Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

The combination of the driving-springs, a counter-shaft connected thereto by differential gearing, a gear-wheel loosely mounted on
25 said counter-shaft and adapted to drive a clock, another shaft connected to the driving-springs and carrying a loose gear-wheel, a clutch mounted on said shaft and arranged to normally compel said gear-wheel to rotate
30 with the shaft yet allowing the gear-wheel to remain stationary during the winding operation, a controlling-clock operatively connected to said gear-wheel, and clock-operating connections extending from said control-
35 ling-clock, substantially as described.

SIGISMUND B. WORTMANN.

Witnesses:

JOHN LOTKA,

JAMES M. HENLEY.