J. IVES.

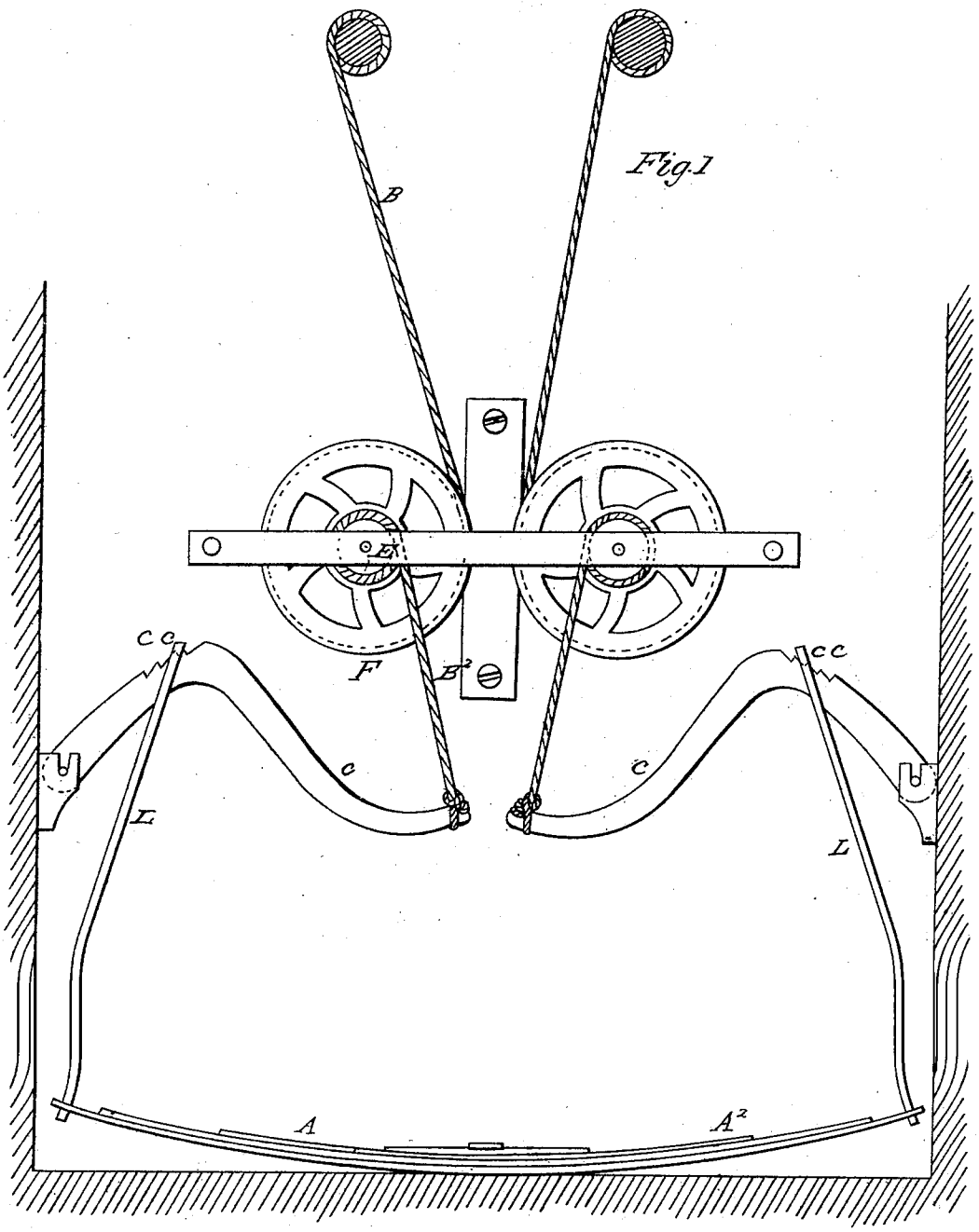
2 Sheets—Sheet 1.

Clock.

No. 3,928.

Patented Feb. 24, 1845.

Fig. 1



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2 Sheets—Sheet 2.

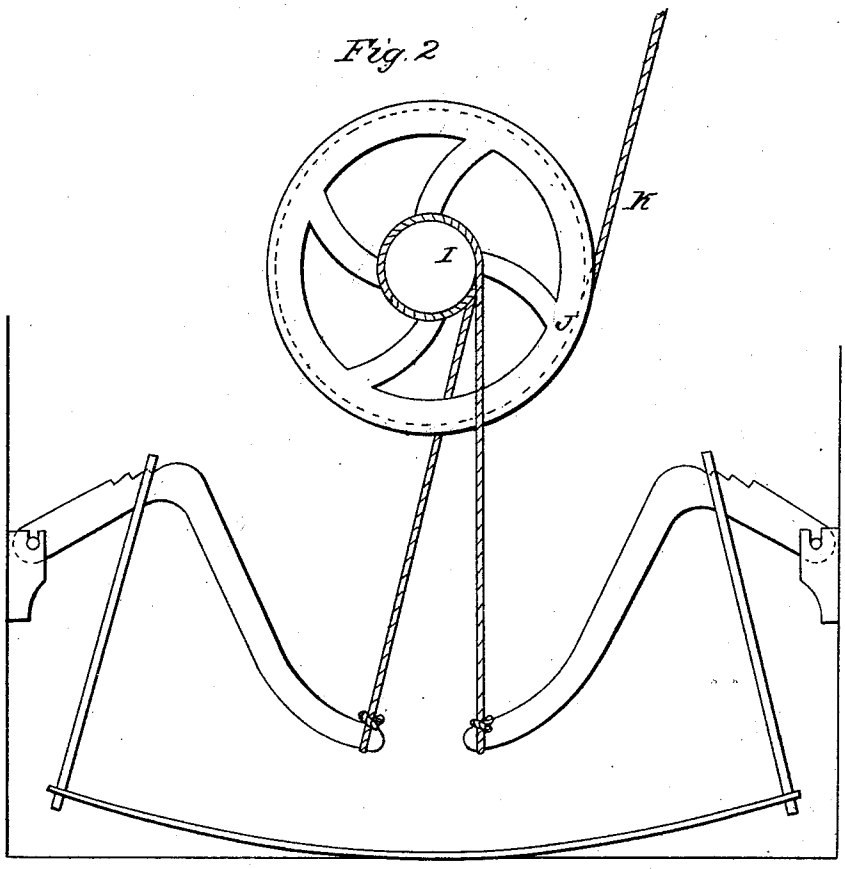
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Clock.

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Fig. 2



N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JOSEPH IVES, OF BRISTOL, CONNECTICUT.

PROPELLING POWER FOR CLOCKS.

Specification of Letters Patent No. 3,928, dated February 24, 1845.

To all whom it may concern:

Be it known that I, JOSEPH IVES, of Bristol, in the county of Hartford and State of Connecticut, have invented a new and useful improvement in the propelling-power of clocks and other timepieces, by which a regular first mover and maintaining power is obtained without the use of a weight or a coiled spring and fusee, which improvement is described as follows, reference being had to the annexed drawing of the same, making part of this specification.

Figure 1 is a front elevation. Fig. 2 is an elevation of a second modification.

I make use of a spring A′ Fig. 1, single or with leaves, fastened by its center to the bottom of the clock case or in any convenient place. This spring constitutes the first mover and maintaining power. Now if the cord or chain B that is usually wound on the barrel be attached directly to the extremity of this spring it would draw the said cord or chain with more force, and unwind a greater quantity of it from the barrel, at one time than another; so that the movement of the clock would never be regular. To correct this irregularity of the spring I have contrived to have the end of the spring applied to a curved lever C of the second order to which the cord or chain B'^2 is connected which lever is continually increasing in length and power in the same ratio that the force of the spring decreases or becomes weaker as it extends itself, thus maintaining the action of the spring regularly and equally which is the great desideratum in the construction of clocks with plain springs instead of the heretofore used cumbersome and expensive weights.

As it has been found by me that the weakening of the spring is not precisely in proportion to the increase of the angle formed by a straight lever with a vertical plane, therefore the lever should not be made straight but experience shows that it should be curved so as to approximate to the figure represented at C in Fig. 1. It should likewise be notched on the upper side as at *c c* so that the action of the spring may be augmented or diminished at pleasure by changing the position of the connecting link L on said lever. The fulcrum of the lever may be placed at the side of the case or in any convenient situation. The cord or chain B^2 to be wound around the axle of the wheel may be attached to the end of the lever by any suitable means. It is then wound around a small axle E on which there is a large wheel F around which the cord is wound; from this wheel it is conveyed to the barrel G of the clock to the circumference of which it is attached in the usual way.

One end of the spring may be made to operate the time part of the clock and the other the striking part, the cord of the striking part being arranged on the same principle. Both ends of the spring, however, may be made to act on the barrel of the time part of the clock by carrying the cords or chains around a central axle I, Fig. 2. on opposite sides; the ends of the springs and levers being adjusted to correspond therewith, on which axle a large grooved wheel J is placed to which the chain or cord K is attached and from which it is carried to the barrel of the clock. By the above described arrangement it will be perceived that a great length of cord or chain can be made to wind and unwind on or from the barrel at a uniform and sufficient tension in a small case.

The levers may be differently shaped from those above described and may be arranged in the center of the case or other place instead of the sides to produce the same result, for instance they may be made partly curved and partly straight with the fulcrum at the point where the curved and straight portions of the levers meet, having a pulley at the lower extremity of the straight part of the lever around which the cord from the barrel passes the cord from the end of the spring being attached to the upper or curved arm of the lever.

When the diameter of the axle E is diminished and that of the wheel F is increased for the purpose of gaining a greater length of barrel-cord the power of the spring must be augmented in a proportionate degree by adding leaves thereto as shown at A^2, Fig. 1, by which any necessary degree

of power may be obtained for unwinding any required length of cord from the barrel without straining the spring.

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

The mode of equalizing the tension of the cord or chain of the barrel by the combination of the lever, link, and spring whether constructed and arranged precisely in the manner described or in any other mode substantially the same—Fig. 1.

JOSEPH IVES.

Witnesses:
WM. P. ELLIOT,
EDW. MAHER.