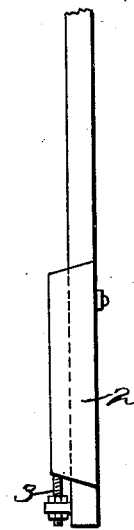
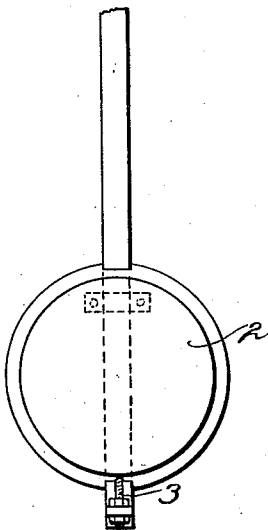
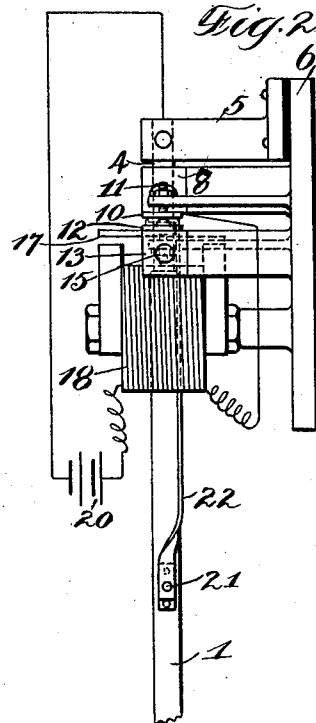
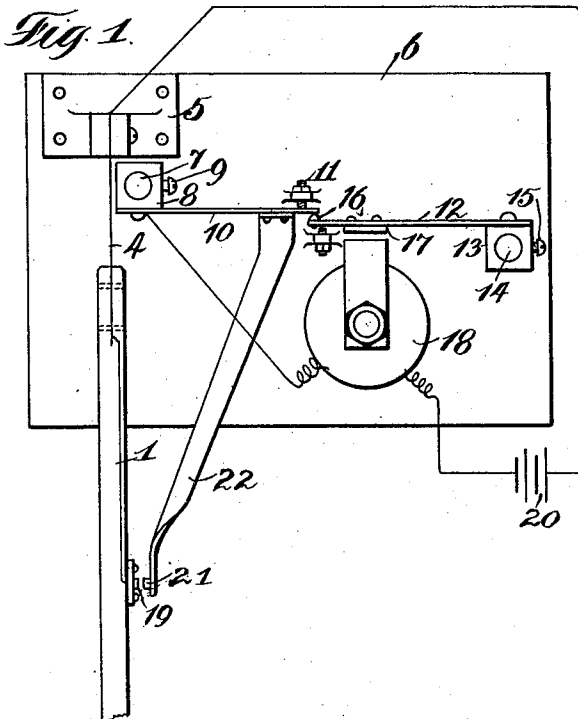


C. R. MOORE.
TIMING MECHANISM.
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1,033,030.

Patented July 16, 1912.



Witnesses.

J. E. Folk.

Wm. E. Greene

Inventor.

Charles R. Moore

per *G. R. Cragg.*

Attorney.

UNITED STATES PATENT OFFICE.

CHARLES R. MOORE, OF LA FAYETTE, INDIANA.

TIMING MECHANISM.

1,033,030.

Specification of Letters Patent.

Patented July 16, 1912.

Application filed April 19, 1911. Serial No. 622,160.

To all whom it may concern:

Be it known that I, CHARLES R. MOORE, citizen of the United States, residing at La Fayette, in the county of Tippecanoe and State of Indiana, have invented a certain new and useful Improvement in Timing Mechanism, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to timing mechanism and is of particular service in connection with pendulum clocks, though it is not to be limited to this class of devices.

My invention has for its object the provision of improved means for maintaining uniform swinging movement of the oscillating members of timing devices which employ the same.

In practising my invention I employ a mechanical load, as distinguished from an electro-magnetic load, which mechanical load is suitably applied to the oscillating member preferably once in each cycle of movement of said member. I employ means for restoring the mechanical load to normal each time after it has performed its function, the restoring means being also preferably mechanical. This restoring means desirably also operates as an arresting device for holding the mechanical load in the normal or idle position to which it has been put. Electro-magnetic means are employed for withdrawing the support of the arresting or mechanical load holding device, this electro-magnetic means having an electro-magnet whose winding is included in a circuit that is governed by a switching device whose operation is controlled by the oscillating member of the timing device. Once, preferably, in each cycle of movement of the oscillating member, a switch element is brought into circuit closing or governing relation with another switch element in order that said electro-magnet may operate upon the mechanical load holding device to withdraw the support from the mechanical load and permit the mechanical load to operate upon the oscillating member to maintain the amplitude of the oscillations of the oscillating member constant. The mechanical load desirably exercises its function through a part of the switching device.

I will explain my invention more fully by reference to the accompanying drawing

showing the preferred embodiment thereof and in which—

Figure 1 is a view in front elevation, the circuit connections being diagrammatically indicated; Fig. 2 is a view in side elevation, circuit connections being also indicated in this figure.

Like parts are indicated by similar characters of reference in both figures.

The type of timing mechanism shown in the drawing is one which includes an oscillating member comprising a pendulum rod 1 carrying a pendulum bob or weight 2 at its lower end and which is adjustable slightly along the length of the rod by means of well understood mechanism 3. The pendulum rod is swingingly mounted at its upper end by means of a steel blade or ribbon 4 riveted at its lower end to the upper end of the pendulum rod and fastened at its upper end to a bracket 5. The bracket 5 is mounted upon but insulated from a mounting plate 6. A rigidly mounted post 7 projects forwardly from the plate 6 and is desirably insulated therefrom. A block 8 is slipped over the post and may be held in any rotatably adjusted position by means of a set screw 9. A spring 10, which constitutes the preferred form of mechanical load for maintaining the amplitude of the pendulum oscillations uniform, is rigidly secured at one end to the block 8. The spring 10 is preferably in the form of a leaf spring and its tension (adjustable by turning the block 8) is such that the free or unmounted end thereof moves downwardly when free so to do.

I employ a load holding device, which desirably performs its function mechanically, for maintaining the free end of the spring 10 at the upper limit of its movement, this upper limit desirably being adjustably determined by means of a stop 11. The load holding device which I prefer is one which includes a strip metal spring 12 anchored at one end to a block 13 rotatably adjustable upon a post 14 and which block is secured in its adjustment by a set screw 15. The spring 12 is placed under such tension that it will move upwardly when assuming a natural position. In this position the spring 12, which is stronger than the spring 10, will hold the free end of the spring 10 against its stop 11. The spring 12 desirably carries the piece 16 upon its free end for the pur-

pose of affording the means through which the spring 12 exercises its function. The spring 12 also carries an armature 17 that forms a part of the magnetic circuit of an electro-magnet 18. The winding of this electro-magnet is included in a circuit, here shown to be normally open, that also includes a circuit contact terminal 19 carried by the pendulum rod or oscillating member, the metallic ribbon 4, battery 20, the load spring 10 and the contact 21 carried by the load spring and preferably mounted upon the lower end of an arm 22 projecting downwardly from and attached to the load spring 10 in the neighborhood of its free end. The contacts 19 and 21 are so relatively positioned that they will be engaged slightly before the pendulum reaches one of its extreme positions, the lower end of the arm 22 being pressed by spring 10 to enable the contact 21 to yield slightly in the direction in which the pendulum is moving, whereby good electrical engagement between the contacts is assured. When the contacts 19 and 21 have become engaged, the circuit including the electro-magnet 18 is closed, this electro-magnet being of sufficient strength to depress the spring 12 in order to permit the spring 10 to move downwardly at its free end and thereby exert a push upon the pendulum rod for the purpose which has been stated. The contact 21 follows the contact 19 through a slight portion of the return movement of the pendulum rod so that the spring 12 is maintained out of action a sufficient length of time to allow the spring 10 to perform its function. As the return movement of the rod continues, the contacts 19 and 21 become separated, whereupon the armature 17 is released and the spring 12 which carries the armature is permitted to move upwardly at its free end thereby to move the free end of the weaker spring 10 upwardly, power thereby being again stored in the spring 10 by placing it under tension to enable it to exert a push upon the pendulum rod when said pendulum rod returns to that position in which the contacts 19 and 21 are closed. It will be observed that the push upon the pendulum rod is exerted by a force which is uniform, which result is accomplished by a mechanical agency as distinguished from an electro-magnetic agency. As a consequence, the desired result is secured independently of the battery strength so that there is no variation in the auxiliary

force applied to the pendulum, it being immaterial what the battery strength is so long as it is sufficient properly to energize the magnet.

An important characteristic of my invention resides in the use of a switching device having a member through which the load, mechanical or otherwise, exerts its effect upon the pendulum, experiment having proven that the pressure necessary to drive the pendulum is sufficient for establishing the electrical circuit if the contacts are properly made and are composed of suitable material such as platinum.

While I have herein shown and particularly described the preferred embodiment of my invention, I do not wish to be limited to the precise construction and circuit arrangement shown as changes may readily be made without departing from the spirit of the invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent the following:—

Timing mechanism including an oscillating member; a spring for intermittent driving engagement with the oscillating member to maintain the amplitude of the oscillations of said oscillating member substantially uniform; a second spring of sufficient strength to place the aforesaid spring under tension and break its driving engagement with the oscillating member; a stop for limiting the extent to which the first spring may be moved by the second spring; electro-magnetic means for removing the influence of the second aforesaid spring from the first aforesaid spring to permit the first aforesaid spring to perform its function; and a circuit changing switching device for governing the electro-magnetic means and in turn governed by said oscillating member, said switching device including a circuit making portion moving with the oscillating member and a circuit making portion moving with the first aforesaid spring and through which circuit making portions the first aforesaid spring exercises its mechanical function upon the oscillating member.

In witness whereof, I hereunto subscribe my name this 20th day of March A. D., 1911.

CHAS. R. MOORE.

Witnesses:

NIBLE HINER,
JOS. A. ANDREW.