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W. J. HERSCHEDE ET AL

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CLOCK

Filed April 14, 1930

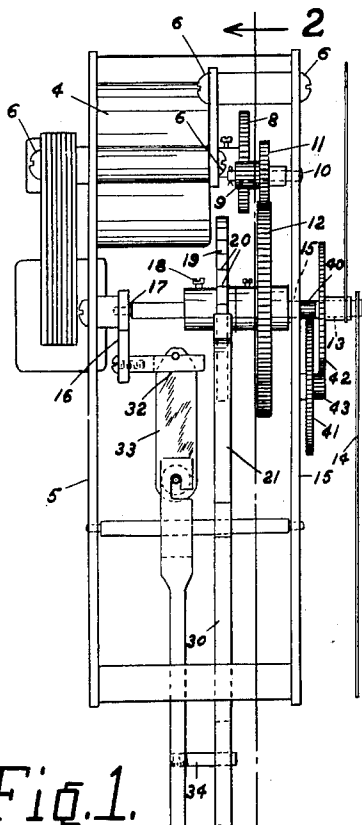


Fig. 1.

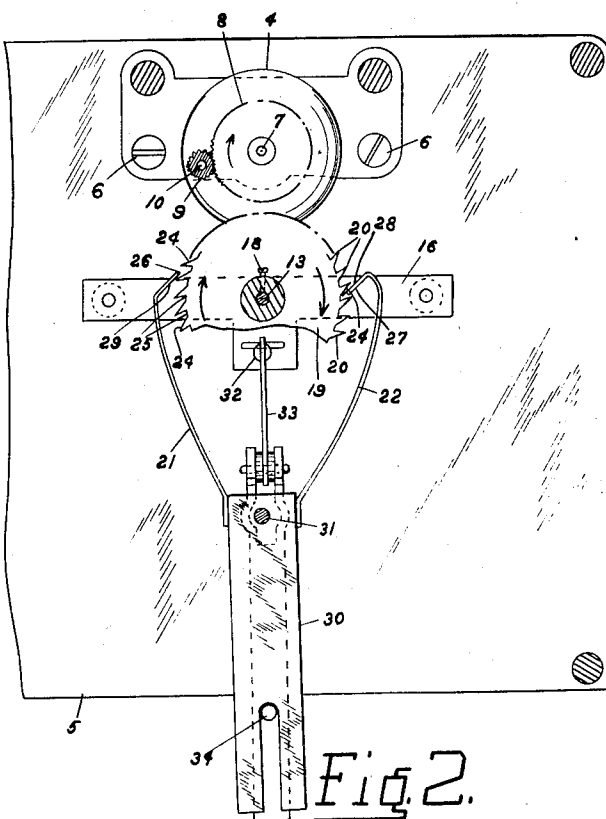


Fig. 2.

Inventors

Walter J. Herschede
Walter Eberhardt
Albert Hellmuth

By *Murray E. Zugelder*
Attorneys

UNITED STATES PATENT OFFICE

WALTER J. HERSCHDEDE, WALTER EBERHARDT, AND ALBERT HELLMUTH, OF CINCINNATI, OHIO, ASSIGNORS TO THE HERSCHDEDE HALL CLOCK COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO

CLOCK

Application filed April 14, 1930. Serial No. 443,998.

This invention relates to improvements in clocks regulated by means other than a pendulum.

An object of the invention is to provide a clock regulated by means other than a pendulum, but having applied thereto a pendulum swung by power from the power means and having no control over the speed of operation of the time keeping mechanism.

Another object is to provide a novel means for operating a clock pendulum, said means being of such character as to permit normal operation of the time keeping mechanism of the clock even though the swinging movement of the pendulum be interfered with.

Another object is to provide a device of the above type in which the pendulum is self-starting after having its swinging movement arrested.

These and other objects are attained by the means described herein and disclosed in the accompanying drawing, in which:

Fig. 1 is a side elevational view of a time-keeping mechanism, showing clearly the invention and its application to the time-keeping mechanism of a clock.

Fig. 2 is a cross sectional view on line 2—2 of Fig. 1.

The present invention is concerned with the application, to a complete clock not requiring a pendulum for regulation thereof, of a pendulum actuated by the clock but ineffective for regulating the clock, the pendulum being provided solely for the purpose of decoration. In the drawing, 4 indicates a power means for driving the time keeping mechanism of the clock. The power means may be of any suitable character, but for purposes of clarity and simplicity of description, the power means is exemplified herein as an electrical motor 4 having a drive shaft 7, the motor being secured to the spaced plates 5 forming the frame of the mechanism, by any suitable means such as screws 6. The means for regulating operation of the time keeping mechanism may be within the motor itself, but the invention need not be restricted in this regard for it will become readily apparent, as the description proceeds, that the

manner of regulating the clock is immaterial to the invention.

To the drive shaft 7 of the power means is fixed a large gear 8 which meshes with a pinion 9 mounted for free rotation upon a fixed stud 10 supported by plate 5. A second pinion 11 which may be integral with or secured to pinion 10, also is freely rotatable on said stud. Pinion 11 meshes with a large gear 12 which is fixed to the rotatable shaft 13 carrying the seconds hand 14. The arrangement of gearing is such that the seconds shaft 13 rotates once in a minute. Shaft 13 is journaled in the mechanism frame, or in one frame plate 5, as at 15, and an auxiliary plate 16 as at 17.

On the seconds shaft 13 is fixedly mounted, by any suitable means such as set screw 18, a pendulum actuating member 19 which may be in the form of a toothed wheel rotating with the shaft in a clockwise direction of rotation. The teeth 20 of the wheel are adapted to cooperate with a pair of yielding or spring arms 21 and 22 for swinging the pendulum 23 during operation of the time keeping mechanism. The pendulum may be of aluminum or other light weight material and is not necessarily provided with the customary adjustments unless it is desired to provide such adjustments for the sake of appearance.

The pendulum actuating member or wheel 19 has extending from its periphery a series of teeth or pusher elements 20 each of which has an inclined portion 24 substantially tangential to the periphery of the wheel. The teeth or pusher elements extend in a direction substantially opposite to the direction of rotation of the wheel 19. A flat stop portion 25 is provided between successive teeth 20, which the upwardly extending limiting finger 26 of arm 21 may abut during swinging movement of the pendulum to the left, for limiting the swinging of the pendulum. Spring arm 22 is provided at its free end with a downwardly and inwardly extending inclined finger 27 having an upper inclined sliding face which the inclined portions 24 of the pusher elements are adapted to abut during rotation of wheel 19. It

will be noted that finger 26 has a lower inclined sliding face 29 for sliding engagement with the inclined face 24 of each pusher element.

From the foregoing, it will be readily apparent that rotation of wheel 19, in the direction indicated by the arrow, will cause outward movement of the pusher arm 22 by reason of the sliding of face 24 over face 28. The rocking arm 30, to which the arm 22 is soldered or otherwise secured, will thereby be moved upon its pivot 31 for swinging or rotational movement in a clockwise direction. At the same time, the abutting or limiting portion 26 will proceed inwardly toward one of the stop surfaces 25 intermediate the teeth or pusher elements at the opposite side of the wheel. Said movement of the rocking arm 30 is thereby limited. As the pendulum swings back toward and beyond the perpendicular position by reason of the sliding movement of the other spring arm 21 upon the inclined face 24 of one of the pusher elements, the abutting end of finger 27 moves into position for forming a stop. It will thus be observed that the pusher elements operate upon both of the spring arms for swinging the pendulum, and that the fingers of both arms serve as stops or limiting means. The pendulum 23 may be suspended from a stud or bar 32 by any suitable means, such as a flexible strap 33, and have the movement of the rocking arm 30 transmitted thereto by a pin 34 connecting the arm and pendulum.

It is of importance that the spring arms be of such resiliency that the rotation of wheel 19 will not be arrested or precluded in the event that the pendulum be held against swinging movement. In other words, holding of the pendulum in the position shown in Fig. 2 should not result in stalling of the motor 4, but should cause the fingers 26 and 27 to jump over the teeth 20 as the wheel 19 is rotated by the motor.

It will be observed that by the foregoing construction, the appearance of a pendulum controlled clock and also the familiar ticking sound thereof, are retained though the clock mechanism is of the type not requiring a pendulum. Removal of, or arresting the swinging movement of the pendulum will not affect the accurate keeping of time, and the swinging of the pendulum will be automatically resumed when permitted freedom of movement.

Inasmuch as the hour and minute hand moving mechanisms of the clock are in no manner affected by the provision of this character of pendulum, and since such mechanisms may be of any approved type, it will be sufficient to state that the intermeshing gears 40, 41, 42 and 43 comprise suitable means for actuating the clock hands by means of the motor 4. The seconds hand and its

shaft are, of course, parts of the time keeping mechanism.

It is to be understood that various modifications and changes in structural details of the device may be made, within the scope of the claims without departing from the spirit of the invention.

What is claimed is:

1. In combination with a time keeping device of the class described and comprising a constant speed power means, a pendulum swung by power from the constant speed power means, and yielding means cooperating with the pendulum and arranged to permit continued operation of the power means in the event that the pendulum be held against swinging movement.

2. In a time keeping device the combination with a frame and a constant speed power means comprising an electrically operated continuously driven motor and a synchronized electrical circuit with which the motor is electrically connected, the speed of which motor is unaffected by imposition of slightly varying loads and dependent only upon variations in the energizing electrical circuit, said motor being supported by the frame, of a pendulum mounted for swinging movement relative to the frame, a pendulum actuating member driven by the constant speed power means, a pair of yieldable arms movable with the pendulum and having ends disposed at opposite sides of the pendulum actuating member, spaced pusher elements on the said actuating member for cooperating with the yieldable arms said pusher elements being arranged relative to the arms for alternately moving the arms in opposite directions, said yieldable arms serving to permit continued operation of the power means in the event that the pendulum be held against swinging movement.

3. In combination with a time keeping device of the class described and comprising a constant speed power means, a pendulum actuating member driven by the said power means, a pendulum swung by power from the power means through the agency of the pendulum actuating member, and yielding means cooperating with the pendulum and the actuating member and arranged to permit continued operation of the power means in the event that the pendulum be held against swinging movement.

4. In a time keeping device the combination with a frame and a constant speed power means comprising an electrically operated continuously driven motor and a synchronized electrical circuit with which the motor is electrically connected, the speed of which motor is unaffected by imposition of slightly varying loads and dependent only upon variations in the energizing electrical circuit, said motor being supported by the frame, of a pendulum actuating means driven by the

5 said constant speed power means, a pendulum swung by power from the power means through the agency of the pendulum actuating member, and yielding means cooperating with the pendulum and the actuating member and arranged to permit continued operation of the power means in the event that the pendulum be held against swinging movement.

10 In testimony whereof, we have hereunto subscribed our names this 10th day of April, 1930.

15 WALTER J. HERSCHEDE.
WALTER EBERHARDT.
ALBERT HELLMUTH.