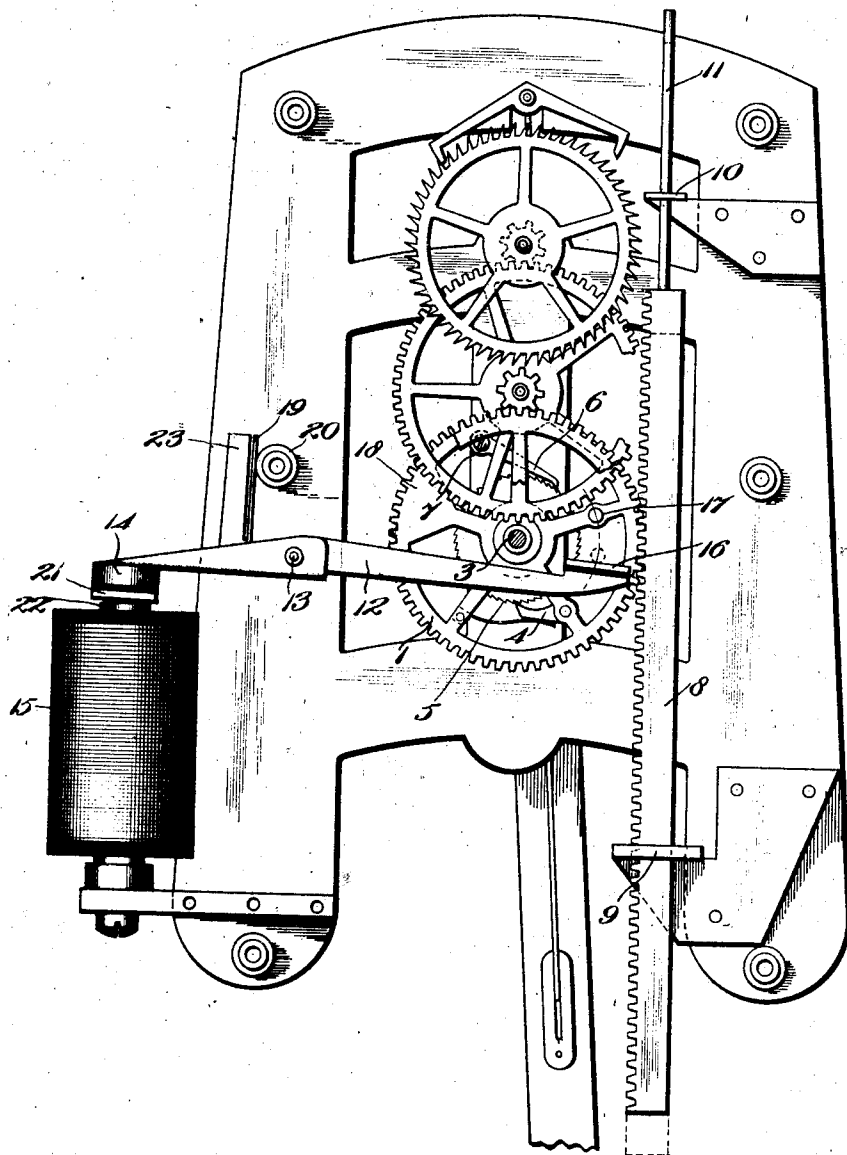


W. H. THOMPSON.
ELECTRIC CLOCK.
APPLICATION FILED APR. 1, 1912.

1,060,380.

Patented Apr. 29, 1913.
2 SHEETS—SHEET 1.

Fig. 1.



Witnesses
Byron B. Collins.
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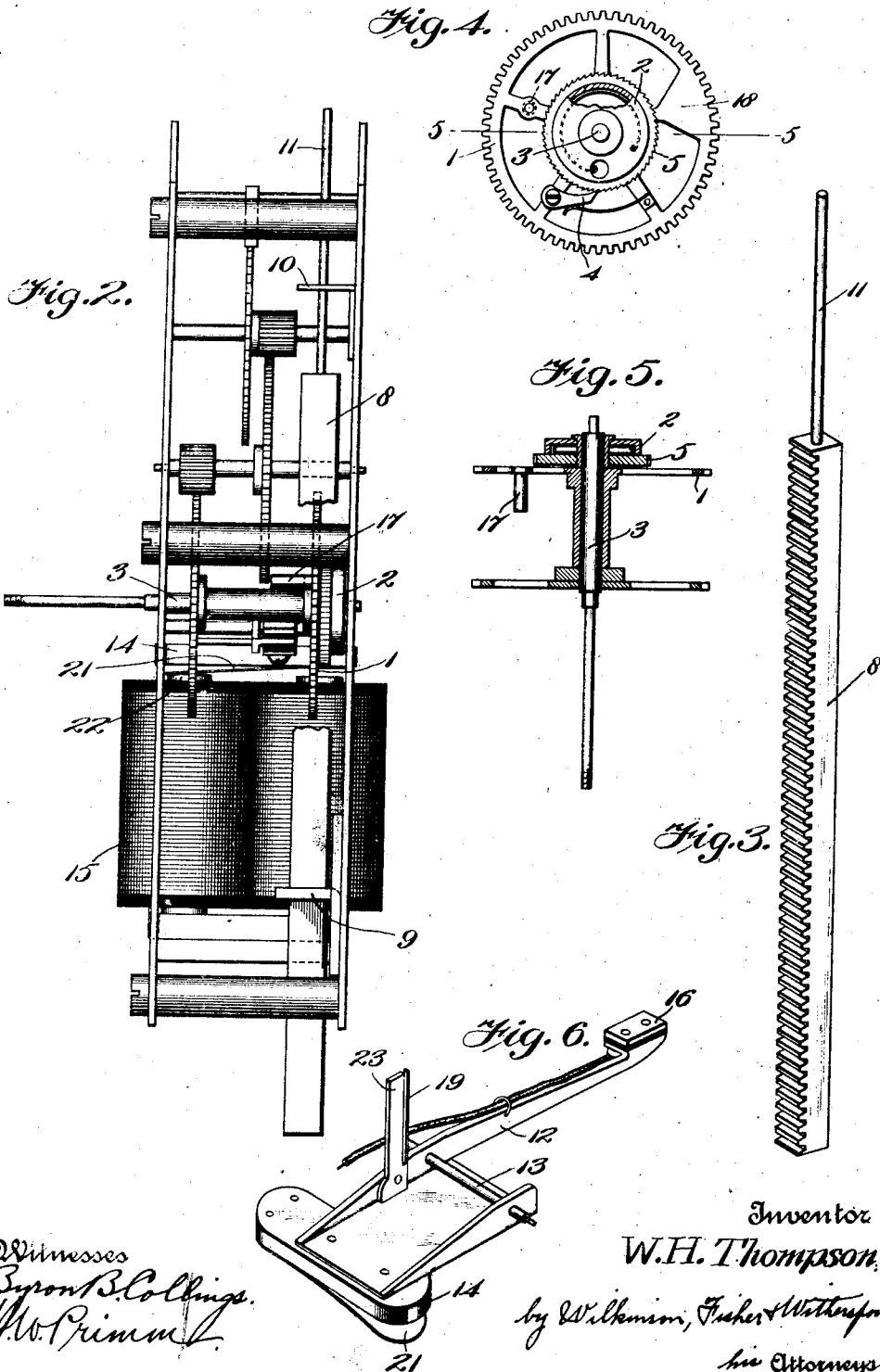
Inventor
W. H. Thompson,
by *William Fisher & Witherspoon*
his Attorneys

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UNITED STATES PATENT OFFICE.

WILLIAM HENDERSON THOMPSON, OF MEMPHIS, TENNESSEE, ASSIGNOR TO NATIONAL DISPLAY SYSTEM, INC., OF MEMPHIS, TENNESSEE, A CORPORATION OF TENNESSEE.

ELECTRIC CLOCK.

1,060,380.

Specification of Letters Patent.

Patented Apr. 29, 1913.

Application filed April 1, 1912. Serial No. 687,930.

To all whom it may concern:

Be it known that I, WILLIAM HENDERSON THOMPSON, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Electric Clocks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in electric clocks, and it consists in the constructions, combinations and arrangements herein described and claimed.

An object of my invention is to provide an improved electric clock, in which a uniform driving force will be exerted on the clock train with an entire freedom from binding and frictional strains under all practical conditions of continuous operation.

A further object of my invention is to provide an improved electric clock having shiftable electrical contacts adapted to make and break contact at different points on their engaging surfaces, thereby minimizing danger of deterioration of the engaging surfaces by sparking.

A further object of my invention is to provide an improved electric clock, in which cooperating electrical contacts for the controlling current are carried, respectively, by a gravity-actuated driving mechanism and an independently movable electrically-actuated means, for engagement with a combined rolling and sliding contact, thereby insuring the maintenance of effectively clean contact surfaces under conditions of long continuous use.

In the accompanying drawings forming a part of this application, and in which similar reference symbols indicate corresponding parts in the several views:—Figure 1 is a front elevation of a well known type of clock train, with one embodiment of my invention applied thereto; Fig. 2 is a side elevation of the construction shown in Fig. 1; Fig. 3 is a perspective view of the reciprocatingly-mounted rack constituting my free, gravity-actuated driving member; Fig. 4 is a detail view of the balanced gear wheel and spring-retaining mechanism rotatably mounted on the center post for transmitting a uniform driving force from the gravity-

actuated rack; Fig. 5 is an axial section of the parts shown in Fig. 4; and Fig. 6 is a perspective view of the electrically-actuated lever for storing power in the gravity-actuated driving rack.

Referring to the drawings, a gear wheel 1 and a spring-retaining mechanism 2 are rotatably mounted on the center post 3 of any well known clock train, and operatively connected by a spring-pressed pawl 4 and ratchet teeth 5 carried by the respective parts; reverse movement of said maintaining mechanism being prevented by a gravity-actuated pawl 6 pivoted at 7 to the clock frame in engagement with said ratchet teeth 5.

A vertical rack 8 is reciprocatingly mounted in guides 9 and 10 on the clock frame in mesh with the gear wheel 1; the upper portion of said rack member comprising a rod 11 sliding in the guide 10 to prevent any danger of binding through angular displacement of the rack guides. The rack 8 constitutes a free, gravity-actuated member tangentially engaging the gear 1 to transmit a uniform driving force through the latter under all practical conditions.

A lever 12 is fulcrumed at 13 and carries at its opposite ends the armature 14 of an electro-magnet 15 and an insulated contact plate 16 for engagement by a contact pin 17 on the gear wheel 1; said gear wheel being provided with a weighted portion 18 for accurately counter-balancing the pin 17 and pawl 4 carried thereby. A flat spring 19 on the lever is yieldingly maintained in engagement with a fixed stop 20 by a single leaf spring 21 of non-magnetic material carried by the armature 14 in engagement with the magnetic core 22; the swing of said lever 12 being limited by a rigid arm 23 carried thereby for engaging said stop 20.

The electro-magnet 15 is shown in an electric circuit having its respective terminals connected to the clock train and to the insulated contact plate 16.

In the operation of my invention, the gradual descent of the rack 8 under the action of gravity transmits a uniform force through the gear wheel 1 to the clock train; the constant product of the weight of said rack and the radius of said wheel transmitting a uniform torque through the maintaining mechanism 2 to the center post 3. As the wheel 1 is thus rotated by the weight

of said rack, the contact pin 17 engages the contact plate 16 and the magnet 15 is energized to sharply attract the armature 14 and swing the lever 12 about its fulcrum. This movement of the lever 12 causes the contact plate 16 to suddenly elevate or kick up, the pin 17 engaged thereby, and thus rotate the wheel 1 to raise the rack 8.

The velocity imparted to the rack causes the latter to move upwardly beyond the position to which it is elevated by the engagement of the contact plate 16 with the pin 17, and thereby rotates the wheel 1 sufficiently to raise said pin 17 from the plate and break the contact therebetween, see Fig. 1. During this sudden elevation of the rack 8, the spring maintaining mechanism maintains a uniform driving force on the center post 3, and insures an accurate and regular operation.

As the contacts 16 and 17 rotate about different points, they engage with a combined rolling and sliding contact which has a scouring effect tending to maintain efficiently clean contact surfaces thereon; this scouring action being progressively augmented after the initial engagement of said contacts by the gradually increased resistance of the spring 19 to the downward movement of the contact plate 16. This improved construction enables the contacts to be advantageously formed of silver, or other metal of high conductivity, and avoids the irregularities due to the residual magnetism and other defects inherent in the platinum contacts of previous constructions.

It will be noted that the impulse of the contact plate 16 is exerted on the pin 17 at a point intermediate of the center post 3 and rack 8, thereby eliminating all danger of wear and irregular running by binding or frictional strains.

I have illustrated and described preferred and satisfactory constructions, but changes could be made within the spirit and scope of my invention.

I claim:—

1. In an electric clock, the combination of a wheel mounted on the center post for transmitting power to the clock train, a free, gravity-actuated member engaging said wheel, and electrically-actuated means for actuatingly engaging said wheel at a point intermediate of said center post and gravity-actuated member.

2. In an electric clock, the combination of a gear wheel mounted on the center post for transmitting power to the clock train, a free rack reciprocatingly mounted in mesh with said gear, electrically-actuated means for actuatingly engaging said gear at a point intermediate of said rack and center post, and electrical contacts on said transmitting and electrically-actuated means for controlling the operation of the latter.

3. In an electric clock, the combination of a gear wheel rotatably mounted on the center post, retaining mechanism connecting said gear to the clock train, a free rack reciprocatingly mounted in mesh with said gear, and electrically-actuated means for actuatingly engaging said gear at a point intermediate of said rack and center post.

4. In an electric clock, the combination of gravity-actuated driving mechanism for the clock train, electrically-actuated means for storing energy in said driving mechanism, an electrical circuit for controlling said means, cooperating electrical contacts in said circuit carried by said driving mechanism and electrically-actuated means for engagement with a combined rolling and sliding action, and means for progressively increasing the engaging pressure of said contacts during such sliding and rolling engagement of the latter.

In testimony whereof, I affix my signature, in presence of two witnesses.

WILLIAM HENDERSON THOMPSON.

Witnesses:

HENRY CROFT,

THOS. M. SCRUGGS.