PATENT SPECIFICATION

Application Date: Feb. 8, 1921. No. 4469/21. **178,248**

Complete Left: Nov. 7, 1921.

(Patent of Addition to No. 167,060: June 26, 1920.)

Complete Accepted: Apr. 20, 1922.

PROVISIONAL SPECIFICATION.

Improvements in and relating to the Synchronisation of Clocks.

We, WILLIAM SAMMONS HUBBARD, of "Byfield", Stoneygate Road, Leicester, Consulting Engineer, ISAAC HARDY PARSONS, of "The Croft", Kibworth Harcourt, near Leicester, Electrical Engineer, and ALFRED ERNEST JOSEPH BALL, of 212, East Park Road, Leicester, Clockmaker, all British subjects, do hereby declare the nature of this invention to be as follows:—

In accordance with this invention, we effect an improvement in that form of the device described in our prior Application No. 17,398 of 1920 in which the vibrator consist of a leaf spring attached to the pendulum, and the stator contains a moving armature fitted with a rack, the control being effected in conjunction with a losing rate.

The present invention consists in providing means for putting the device out of action, but in such a manner that the armature moves as before, and while not operating the control, gives a visual time indication by the visual movement of the armature and the rack fitted thereto, at each periodic impulse, and the object is to enable the owner or caretaker of the clock to verify at any time, the rate and condition of the clock mechanism when uncontrolled by the electrical device, and to, therefore, assure himself that the necessary losing rate exists.

In carrying this, our present invention, into effect, in one form we provide the rack of the stator with a clutch device in the form of a hinge, and we provide a handle or lever by means of which the rack may be moved away from the vibrator to a sufficient extent to prevent engagement at the periodic movement of the armature.

We may provide the clutch with a snap action so as to produce a definite on and off movement, which can be readily felt by the person operating same.

We may provide a pointer and an indicating plate so as to indicate when the device is in action, and when out of action. The indicating plate may be of a size to conveniently protect the bobbin of the electro-magnet, and may also contain instructions or data, and, or, the maker's name.

Instead of moving the rack of the stator away from the spring of the vibrator, we may move the spring away from or out of engagement with the said rack, and so put the device out of action for the purpose hereindescribed.

Dated this 2nd day of February, 1921.

WILLIAM SAMMONS HUBBARD.
I. HARDY PARSONS.
ALFRED E. J. BALL.

COMPLETE SPECIFICATION.

Improvements in and relating to the Synchronisation of Clocks.

We, WILLIAM SAMMONS HUBBARD, of "Byfield", Stoneygate Road, Leicester, Consulting Engineer, ISAAC HARDY PARSONS, of "The Croft", Kibworth Harcourt, near Leicester, Electrical Engineer, and ALFRED ERNEST JOSEPH

BALL, of 212, East Park Road, Leicester, Clockmaker, all British subjects, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

In accordance with this invention which is an improvement in or a modification of the invention of the parent Specification No. 167,060, we effect an improvement in that form of the device in which the vibrator consists of a leaf spring attached to the pendulum, and the stator contains a moving armature fitted with a rack, the control being effected in conjunction with a losing rate.

The present invention consists in providing means for putting the device out of action, but in such a manner that the armature moves as before, and while not operating the control, gives a visual time indication at each periodic impulse, and the object is to enable the owner or caretaker of the clock to verify at any time the rate and condition of the clock mechanism when un-controlled by the electrical device and to therefore, assure himself that the necessary losing rate exists.

In carrying this, our present invention, into effect, in one form we provide the rack of the stator with a clutch device in the form of a hinge, and we provide a handle or lever by means of which the rack may be moved away from the vibrator to a sufficient extent to prevent engagement at the periodic movement of the armature.

We may provide the clutch with a snap action so as to produce a definite on and off movement, which can be readily felt by the person operating same.

We may provide a pointer and an indicating plate so as to indicate when the device is in action, and when out of action. The indicating plate may be of a size to conveniently protect the bobbin of the electro-magnet, and may also contain instructions or data, and, or, the maker's name.

Instead of moving the rack of the stator away from the spring of the vibrator, we may move the spring away from or out of engagement with the said rack, and so put the device out of action for the purpose herein-described.

Referring to the annexed drawings in which like letters indicate like or equivalent parts,

Fig. 1 shows a front elevation of the invention, the device being shown in the "on" position, while,

Fig. 2 shows a front elevation of the device in the "off" position.

Fig. 3 shows a rear elevation, while

Fig. 4 shows the armature and the movable joint of the rack in plan, (underneath view).

Referring to Fig. 1, A shows the electro-magnet of the stator, B the armature —which is pivotted at B^1 to the base B^2— C a brass or other metal plate attached to the armature, (better seen in Fig. 3) and to which is connected the rack D by means of the movable joint or clutch E, controlled by the handle F. G shows the vibrator spring, and H its support which, in turn, is attached to the pendulum rod at its other end, the rod being shown fragmentally only.

H^1 shows a fitting which is clamped to the pendulum rod by means of the screws J, J^1, J^2, and J^3 the fitting being duplicated at the back of the rod. The front part of the fitting is sometimes held by two additional screws J^4 and J^5. The spring support H is slidably connected to the frame H^1 by means of the screws H^2 and H^3 which are tightened when the correct adjustment of the former is obtained.

The lug H^4 carries an adjusting screw H^5 which alters the angular position of the vibrator spring G which is pivotted to its support at G^1. In this figure the rack is shown in the "on" or active position, the rack being in the position at which it engages the vibrator spring on the latter passing over it at the moment of the periodic impulse.

The rack is held in this position by the stud C^2 entering the hole D^1 of the rack D, being impelled by a flat leaf spring C^1 which will be seen in reference to Figure 3. The point of the stud C^2 is rounded, and the inner side of the holes D^1 and D^2 are countersunk to enable the stud to pass into one or the other of the holes, on the handle F being turned from the "on" to the "off" position and *vice versa*.

Referring to Fig. 2, in this figure the parts are as shown in Figure 1 excepting that the rack is shown in its "off" or non-active position. The rack is held in the "off" position by the stud C^2 leaving the hole D^2 and entering the hole D^1 in the rack D, on the handle F being turned from the "on" position to the "off" position as shown. The stud C^2 and the holes D^1 and D^2, together with the parts co-acting therewith, form the clutch device hereinbefore described.

Referring to Fig. 3, A shows the magnet, B the armature, and D the rack as in Figs. 1 & 2. C shows the metal plate, C^1 the flat leaf spring which controls the stud C^2, and which is connected

thereto by being rivetted or otherwise secured. The leaf spring is secured at its fixed end to the plate C by the screws C^3 and C^4, the free portion of the spring between screw C^4 and the stud C^2 providing the necessary flexibility. The rack D is shown in its "on" or active position, the stud C^2 being located in the hole D^1 as shown in Fig. 1.

The pin D^3 is secured to the rack D, and operates between the lugs C^8 and C^9 of the plate C, the object of the pin being to limit the motion of the rack.

In order to adjust the working angular position of the rack so that the device may suit pendulums of different lengths, we provide a slotted hole C^5 in the plate C, which enables this plate to be secured to the armature D at different angles. To effect this adjustment, the screws C^6 and C^7 are slackened, and the plate C turned on the screw C^6 until the desired angle is obtained. The screw C^7 is then tightened to secure the position of the slotted holes, and the screw C^6 also tightened when the plate C is held securely in its desired angular position.

Referring to Fig. 4, D shows the rack, C the plate and E the pivot on which the rack turns. The shoulder F^2 of the handle F is pinned to the rack D at E^1 so as to constrain the rack to turn with the handle.

E^2 shows a short stiff spiral spring which holds the face of the rack firmly against the face of the plate, the exact position being determined by the stud C^2 as hereinbefore described.

The nut E^3 enables an adjustment of the tension of the spring E^2 to be made, the nut being finally tightened by the pin or grub screw E^3.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In a pendulum controlling device as claimed in parent Specification No. 167,060 a hinge or joint disposed between the rack and the armature, so adapted that the said rack may be moved out of the active position, and rendered non-effective while retaining the periodic movement of the armature.

2. In a pendulum controlling device as in Claim 1, a handle attached to the rack by which the said rack may be moved in and out of its active position, and the use of the handle as a pointer to indicate when the device is in or out of action.

3. In a pendulum controlling device as in Claim 1, a movable hinge or joint provided with a snap action so that the rack is held firmly in its "on" position on the one hand, and in its "off" position on the other hand, as herein described.

4. Improved pendulum controlling devices constructed and operating as herein-described and shown.

Dated this 1st day of November, 1921.

W. S. HUBBARD.
I. HARDY PARSONS.
ALFRED E. J. BALL.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1922.

SHEET 1

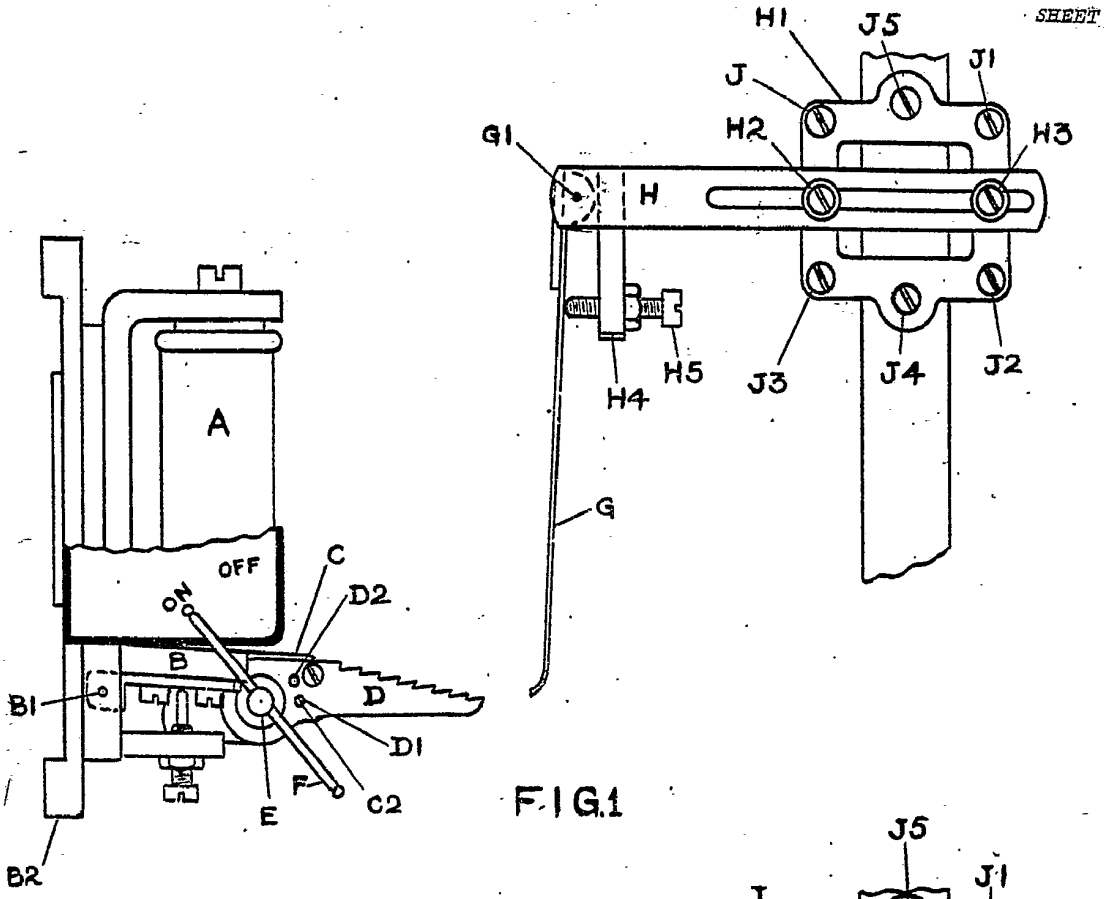


FIG.1

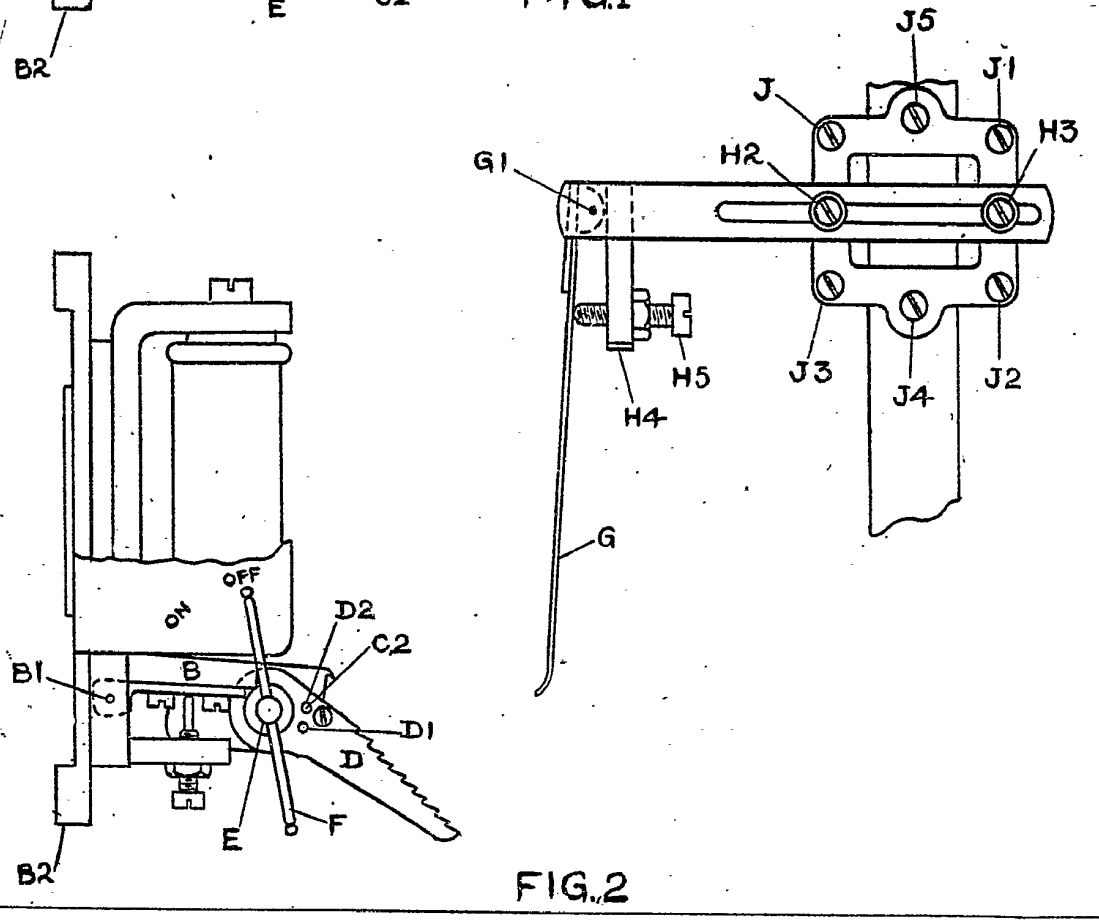
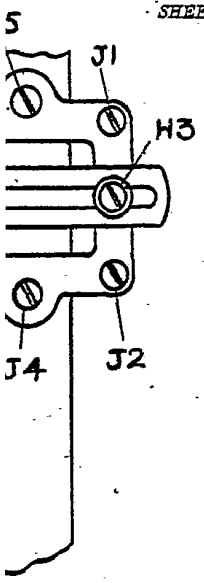
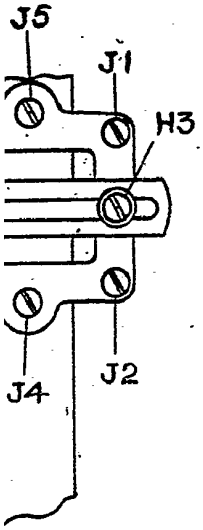


FIG.2





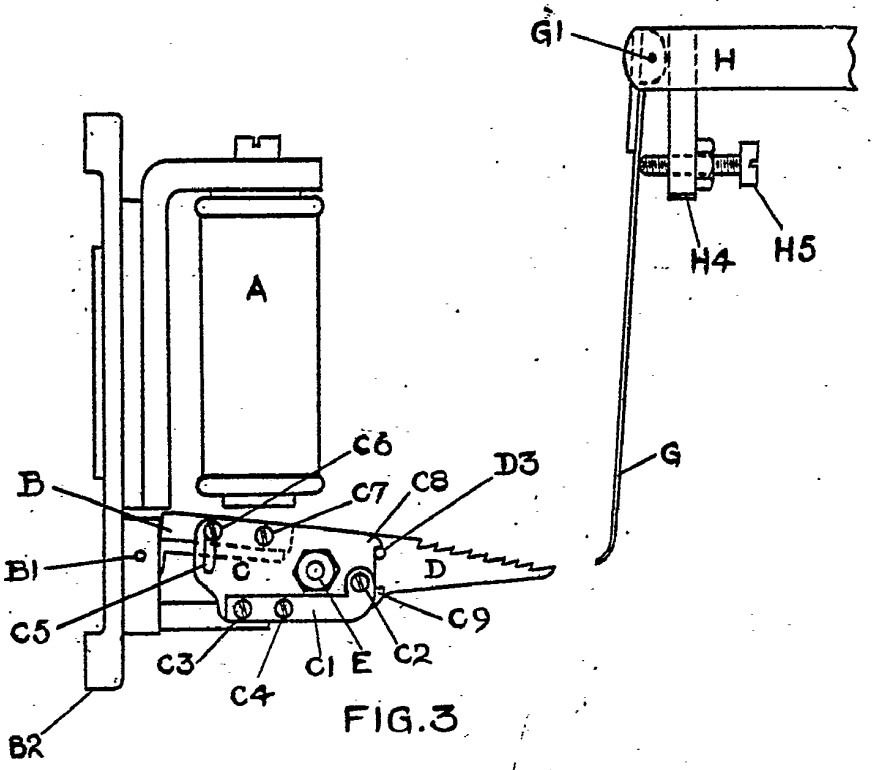


FIG.3

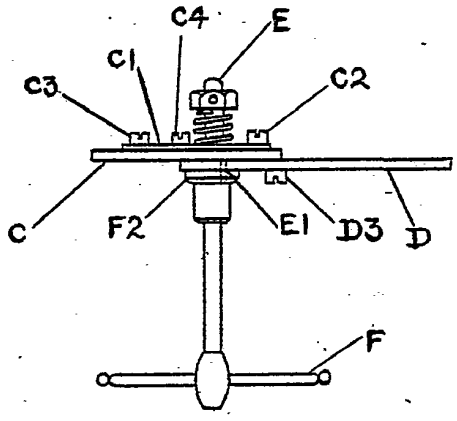
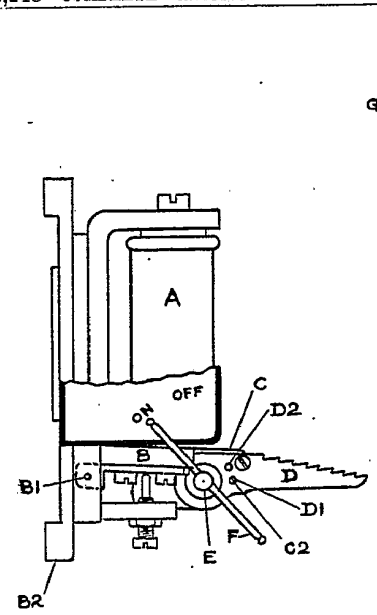


FIG. 4

Malby&Sons, Photo-Litho.

[This Drawing is a reproduction of the Original on a reduced scale]



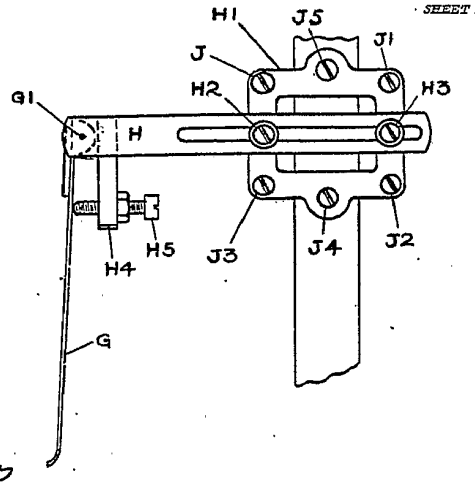
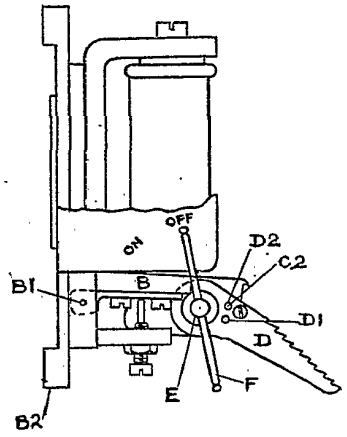


FIG.1



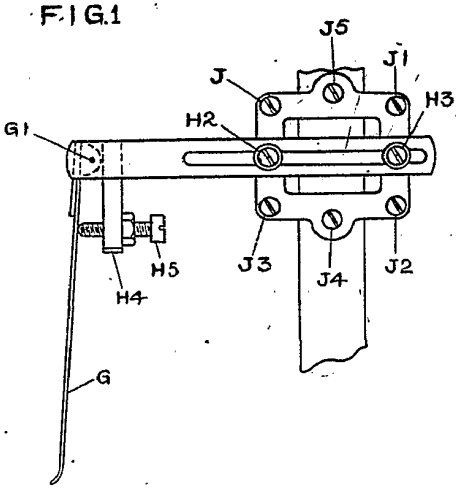
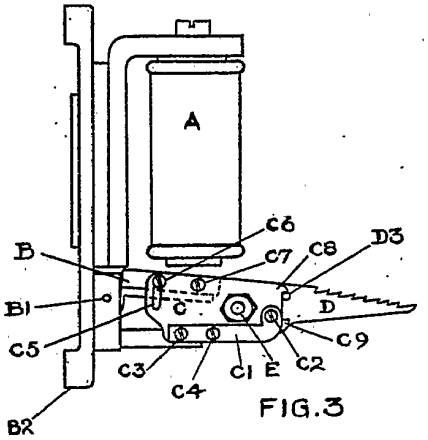


FIG.2



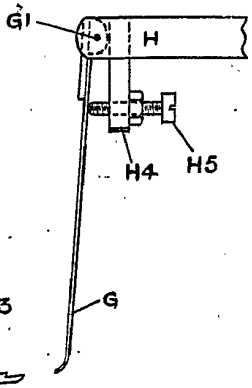


FIG.3

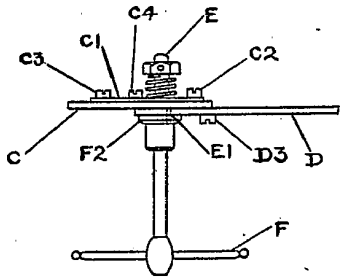


FIG. 4

Malby&Sons, Photo-Litho.