PATENT SPECIFICATION

Application Date: Jan. 30, 1932. No. 2822/32. **385,457**

Complete Left: Oct. 13, 1932.

Complete Accepted: Dec. 29, 1932.

PROVISIONAL SPECIFICATION.

Electric Clocks.

We, ALFRED ERNEST JOSEPH BALL, of 212, East Park Road, Leicester, a British Subject, and GENT & Co., LIMITED, Faraday Works, St. Saviours Road (East), Leicester, aforesaid, a British Company, do hereby declare the nature of this invention to be as follows:—

This Invention relates to Clocks operated by Synchronous Motors from the Service Mains and which are kept running to time by the regulated frequency of the supply and of the type known as non-self-starting.

In particular this Invention refers to Clocks fitted with a Motor which has a multipolar rotor disposed in a non-Ferraris field, the field magnets being also multipolar to correspond. As is well known, rotors of this type, in the absence of special starting means, are very difficult to start because on spinning same, for instance, above synchronous speed it is frequently found that while slowing down, although the rotor must at some moment or other be revolving at synchronous speed, yet it may not be in step with the frequency and consequently will stop.

To overcome this difficulty, various devices have been produced to render starting to be more readily effected, such as fly-wheels or equivalent inertia devices coupled to the rotor by frictional coupling or by spring coupling.

Hitherto it has been considered necessary when employing a fly-wheel starting device, to mount the said wheel on an enlarged portion of the spindle or on a fixed enlargement thereof so that the bearing hole in the fly-wheel may be large so as to introduce comparatively considerable friction between the rotor and the fly-wheel.

A measurement of the friction necessary has been stated to be that which is sufficient to drive the train of wheels while the rotor is not influenced by the current but insufficient to move the rotor when it is so influenced. The small friction present in the herein-described device will not drive the wheel train.

It has also been considered necessary for the said fly-wheel to move rotatably on the said spindle and to either make complete revolutions or be restrained by a spring after moving through a revolution or nearly so.

In accordance with this present invention we employ none of the conditions previously considered essential.

We reduce any friction between the rotor and the fly-wheel to the absolute minimum and we also restrain the rotatable movement of the fly-wheel to, say, two to four degrees only.

In carrying out this Invention we provide a fly-wheel or equivalent inertia member which we mount freely on a portion of the rotor spindle at a position where the said spindle is of small diameter. The object of such a position is to reduce the friction between the hub of the fly-wheel and the spindle to a minimum.

We restrict the movement of the said fly-wheel to a movement through a few degrees only. We may with advantage effect this feature by drilling a cross hole through the hub of the fly-wheel at right angles to the spindle hole and also drill through the spindle at the corresponding position a small hole and fix a pin preferably of steel or other metal in same, the pin also passing through the cross hole in the hub.

This arrangement limits the rotating movement of the fly-wheel on the spindle to the difference in diameter of the pin and the cross hole in the hub of the fly-wheel.

A further advantage accruing from this arrangement is that the pin also prevents the fly-wheel from moving laterally on the spindle.

As an alternative to the foregoing method of restricting the rotating movement of the fly-wheel we may fit collars on the spindle to prevent a lateral movement and provide one of the collars with one or more radial pins which would engage a lateral pin or pins in the fly-wheel.

As a further alternative we may apply a fork attached to one of the collars which may engage a lateral pin in the fly-wheel or any other convenient means of limiting the said rotating movement.

[*Price* 1/-]

The device made in accordance with our Invention is found to be infallible in operation.

Dated this 29th day of January, 1932.

ALFRED E. J. BALL,
For and on behalf of
GENT & COMPANY LIMITED.
H. WADDINGTON,
Director.

COMPLETE SPECIFICATION.

Electric Clocks.

We, CHARLES WILFRED ALEXANDER, of 66, Mere Road, Leicester, and CHARLES ALAN LOVETT, of 15, Park Vale Road, Leicester, both British Subjects, Legal Representatives of ALFRED ERNEST JOSEPH BALL, deceased, late of 212, East Park Road, Leicester, and GENT & Co., LIMITED, of Faraday Works, St. Saviour's Road (East), Leicester, aforesaid, a British Company, 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:—

This Invention relates to Clocks operated by Synchronous Motors from the Service Mains and which are kept running to time by the regulated frequency of the supply and of the type known as non-self-starting.

In particular this Invention refers to Clocks fitted with a Motor which has a toothed, unwound rotor disposed in an alternating magnetic field, the field magnets being also toothed to correspond. As is well-known, rotors of this type are, in the absence of special starting means, very difficult to start because on spinning same, for instance, above synchronous speed it is frequently found that while slowing down, although the rotor must at some moment or other be revolving at synchronous speed, yet it may not be in step with the frequency and consequently will stop.

To overcome this difficulty, various devices have been produced to render starting to be more readily effected, such as fly-wheels or equivalent inertia devices coupled to the rotor by frictional coupling or by spring coupling.

Hitherto it has been considered necessary when employing a fly-wheel starting device, to mount the said wheel on an enlarged portion of the spindle or on a fixed enlargement thereof so that the bearing hole in the fly-wheel may be large so as to introduce comparatively considerable friction between the rotor and the fly-wheel.

A measurement of the friction necessary has been stated to be that which is sufficient to drive the train of wheels while the rotor is not influenced by the current but insufficient to move the rotor when it is so influenced. The small friction present in the herein-described device will not drive the wheel train.

It has also been considered necessary for the said fly-wheel to move rotatably on the said spindle and to either make complete revolutions or be restrained by a spring after moving through a revolution or nearly so.

In accordance with this present invention we employ none of the conditions previously considered essential.

We reduce any friction between the rotor and the fly-wheel to the absolute minimum and we also restrain the rotatable movement of the fly-wheel with respect to the rotor to, say, two to four degrees only.

In carrying out this Invention we provide a fly-wheel or equivalent inertia member which we mount freely on a portion of the rotor spindle at a position where the said spindle is of small diameter. The object of such a position is to reduce the friction between the hub of the fly-wheel and the spindle to a minimum.

Referring to the drawings appended, Figures 1 and 2 show this arrangement. A is the rotor of the Motor, B the spindle of such rotor, C the fly-wheel of the Clock Movement, D a pin, E a slot or hole as indicated and F the back plate of Clock Movement.

We may also restrict the movement of the said fly-wheel as described above by drilling a cross hole through the hub of the fly-wheel at right angles to the spindle hole and also drill through the spindle at the corresponding position a small hole and fix a pin preferably of steel or other metal in same, the pin also passing through the cross hole in the hub.

This arrangement limits the rotating movement of the fly-wheel on the spindle to the difference in diameter of the pin and the cross hole in the hub of the fly-wheel.

A further advantage accruing from this arrangement is that the pin also prevents the fly-wheel from moving laterally on the spindle.

As an alternative to the foregoing

method of restricting the rotating movement of the fly-wheel we may fit collars on the spindle to prevent a lateral movement and provide one of the collars with one or more radial pins which would engage a lateral pin or pins in the fly-wheel.

As a further alternative we may apply a fork attached to one of the collars which may engage a lateral pin in the fly-wheel or any other convenient means of limiting the said rotating movement.

The device made in accordance with our Invention is found to be infallible in operation.

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. A Clock Mechanism driven by a synchronous electric motor of the type described with its fly-wheel loosely coupled by means of a Pin and hole or Slot or equivalent to the Rotor of the Driving mechanism, the fly-wheel being mounted so as to move freely on the rotor shaft within the predetermined limits.

2. The improved means for driving electric clocks substantially as described.

Dated this 11th day of October, 1932.

CHAS. W. ALEXANDER,
CHARLES ALAN LOVETT,
Legal Representatives of Alfred Ernest Joseph Ball, Deceased,
GENT & CO. LIMITED,
For and on behalf of
Gent & Co., Limited.
J. HARDY PARSONS,
Managing Director.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1933.

FIG. 2.

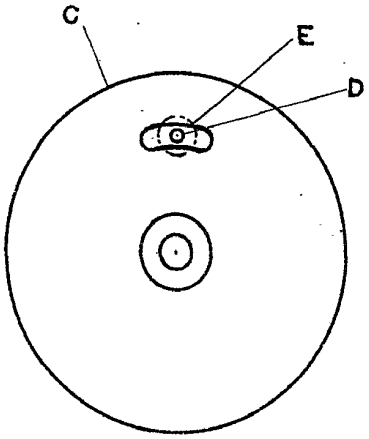
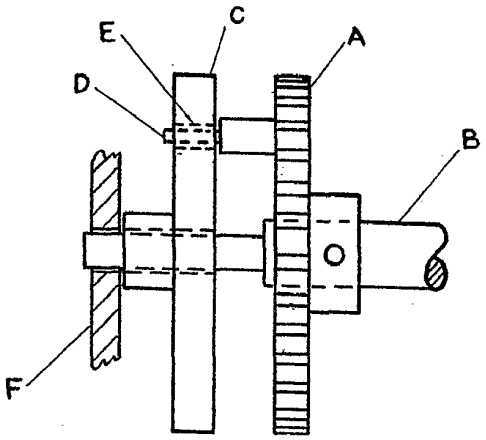


FIG. 1.



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