PATENT SPECIFICATION

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Complete Specification Accepted: Jan. 23, 1936.

(Under Section 91, Sub-sections (2) and (4) (a) of the Patents and Designs Acts, 1907 to 1932, a single Complete Specification was left in respect of this Application and of Application No. 21543/34, and was laid open to inspection on Jan. 25, 1935.)

COMPLETE SPECIFICATION

Improvements in and relating to Clocks

We, SOCIÉTÉ ANONYME DES ETABLISSEMENTS LÉON HATOT, a body corporate organised under the laws of the French Republic, of 12, Rue du Faubourg St. Honoré, Paris, France, 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 of the kind provided with a single index and driven by a motor, for example a synchronous motor, fed from an electric distributing network.

Clocks have been previously proposed of the two following constructions (a) a movable index travelling in front of a fixed scale, and (b) a movable scale travelling in front of a fixed index. In both of these cases, there is no serious inconvenience so long as the clock is intended to indicate the hours only.

However, if minute indications are also desired, the above constructions give rise to some difficulties.

In this latter case, a minute graduation is generally inserted between the divisions of the hour scale, with the result, however, that unless said scale is of very considerable size, the minute divisions are of necessity of very small dimensions, so that the precise reading of the minutes is rendered difficult, if not impossible.

The object of this invention is to provide a clock of the kind referred to, which, whilst being of a simple construction, permits an easy and exact simultaneous reading of hours and minutes opposite one single index.

According to the invention the clock includes a stationary hour scale, an index movable in front of the hour scale, and a movable scale carrying minute indications movable in respect of the hour scale at a relative speed such that said index shows simultaneously the hour on the fixed scale and the minute on the movable scale.

In order that our invention may be better understood and more readily carried into practice, reference will now be had to the accompanying drawings, wherein:—

Figure 1 is a perspective view of a clock according to the present invention, constructed in the form of a lighted rotating globe, comprising two concentric graduated scales, one for the hours and the other for the minutes.

Figure 2 is an axial section of the driving devices of the sphere and of the minute scale.

Figures 3 and 4 are perspective views of the two parts performing the driving of the minute graduation.

Figure 1 shows a clock consisting of a globe 67 of glass or any other translucent matter interiorly lighted by a lamp connected with the electric network. This globe rests on a plate 68 rotated in the direction shown by the arrow t_1 at a speed of one revolution in 24 hours.

The time is shown by a meridian 69 drawn in a thick line (the meridian of Paris for instance) through its position in respect to a fixed scale 70 bearing two graduations of twelve hours. In order that the Paris time should be constantly given to a person at one side of the globe, the meridian is extended completely round the said globe.

An additional scale 71 of minutes is provided between the globe and the fixed scale of hours. The exact minute of the Paris time is given by the Paris meridian. To that effect the minute scale is provided with two series of graduations of 60 minutes each, and it revolves in respect of the globe in an opposite direction to that of the arrow t_1 at a velocity of 1/2 revolution less 1/24 revolution per hour.

Figure 2 shows in axial section the driving parts of the globe and of the minute scale.

The drive from a synchronous motor (not shown) is of the usual type. It comprises a shaft 72 performing one revolution per hour and a sleeve 73 performing one revolution per 12 hours. A toothed

wheel 74 with 22 teeth is keyed on the shaft 72 and a toothed wheel 75 with 28 teeth is keyed on the sleeve 73.

The globe and the minute scale are respectively connected to the concentric sleeves T_2 and T_3 guided by a fixed sleeve T_1 through which is passed an electric cable 76 feeding a lighting lamp set in the socket 77.

The wheel 75 of 28 teeth meshes with the wheel 78 of 56 teeth fast on the sleeve T_2 which supports the plates 79 and 68 carrying the globe. The latter therefore actually performs one revolution in 24 hours, in the direction of the arrow t_1.

The sleeve T_3 has fast thereon a wheel 81 of 48 teeth driven from the wheel 74 of 22 teeth by means of a gear-wheel which is not shown in the figure. The scale 71 graduated in minutes is connected with the sleeve T_3 by means of the milled coupling box 82 supported by a driving ring 83. The coupling box 82 is provided with a plate 84 to which are fixed the arms 80 supporting the minute scale 71.

As the wheel 74 of 22 teeth performs one revolution per hour, the minute scale rotates in the opposite direction to that of the arrow t_1 at a speed of:

$$22/48 \text{ revolution per hour} = (1/2 - 1/24) \text{ revolution per hour} = 11/24 \text{ revolution per hour.}$$

It is therefore seen that the time indicating meridian is always opposite the figure indicating the minute.

The friction is reduced by means of ball-bearings. It has been found of advantage to provide a device for reducing all the diametrical play, so that there should be no risk of the minute scale 71 coming into frictional contact with the globe or with the fixed hour scale 70.

For that purpose ball-bearings 85, 86, 87 and 88 are provided, which are easily regulated by the inclined conical portions of the sleeves T_2 and T_3 and by the nuts and lock-nuts 89 and 90, 91 and 92. The globe 67 rests on the plate 68, itself carried on another plate 79. The surfaces of these plates coming into mutual contact are milled. The coupling box 82 also meshes through a milled portion with the driving ring 83 (Figures 3 and 4). For the setting to time it suffices to turn by hand the sphere or the minute scale, which afterwards continue to rotate at the necessary speed owing to the engagement of the milled portions which are pressed one against the other.

Instead of the guiding devices shown in Figure 2, ordinary commercial ball-bearings could be used, but such bearings have the drawback of necessitating a big increase in the diametrical dimensions of the device. Moreover, they are comparatively expensive. The embodiment shown in Figure 2 has the advantage of being able to be constructed with comparatively thin concentric tubes of no great precision, and of rendering thus possible the reduction of the total diameter and consequently of the cost price. Following the small velocity and the driving through frictional force as described, the strain and the wear through friction will always remain very small.

The meridian 69 which constitutes the moving index of the Paris time, may be rendered easily visible by various means. By way of example, if the globe consists of a glass sphere on which are stuck sections of printed paper, a transparent meridian line may be traced by cutting out a narrow strip of paper. When the lamp is lighted, that line stands out luminously.

The fixed hour scale 70 permits to be read the time corresponding to various points of the world globe.

The driving of the time-mechanism by a synchronous motor is of a particular advantage with the clocks as described above, as it gives a perfect regularity of rotation of the globe, and therefore the perfect coincidence of its rotation with that of the world, a feature which may scarcely be attained by driving a comparatively heavy body by means of a spring mechanism. The above coincidence of motion between the clock and the world permits, however, the exact knowledge of the time of any place of the world, simply by reading the time off the hour scale at its intersection with the meridian of considered place.

It is understood that the embodiment described above and illustrated in the annexed drawings is given only by way of example, and that the invention may be applied to other forms of clock, including a single index and driven by an electric motor from an electric distributing network.

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 of the kind provided with a single index and driven by a motor from an electric distributing network, including a stationary hour scale over which such index is movable, and a scale carrying minute indications movable in respect of the hour scale at such a speed relative to the index that said index shows simultaneously the hour on the fixed scale and the minute on the movable scale.

2. A clock as claimed in claim 1, where-

in the index is carried by a member driven, preferably at a velocity of one rotation per 24 hours, and constituted by a solid revolution e.g. a globe provided with a world map, such index being formed by a complete meridian drawn on said map and indicating the hour in respect of a fixed scale bearing two divisions each of 12 hours, the minutes scale comprising a movable ring member concentric with the fixed scale and bearing two divisions each of 60 minutes and being driven in the direction opposite to that of the rotation of the globe at a velocity of 11/24 of a revolution per hour, said members being driven through gearing by a synchronous motor connected with an alternating current network.

3. A clock as claimed in either of the preceding claims having two vertical concentric tubes mounted on ball races for controlling the index carrying member and minute scale respectively and driven by the clock motor, characterised in that the inner tube is frictionally engaged with the index carrying member, and that the outer tube is frictionally engaged with the minute scale so that said members may be set to the correct time.

4. Clocks constructed and adapted to operate substantially as described with reference to the accompanying drawings.

Dated this 23rd day of July, 1934.

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London, S.W.1,
Agents for Applicants.

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Fig. 1

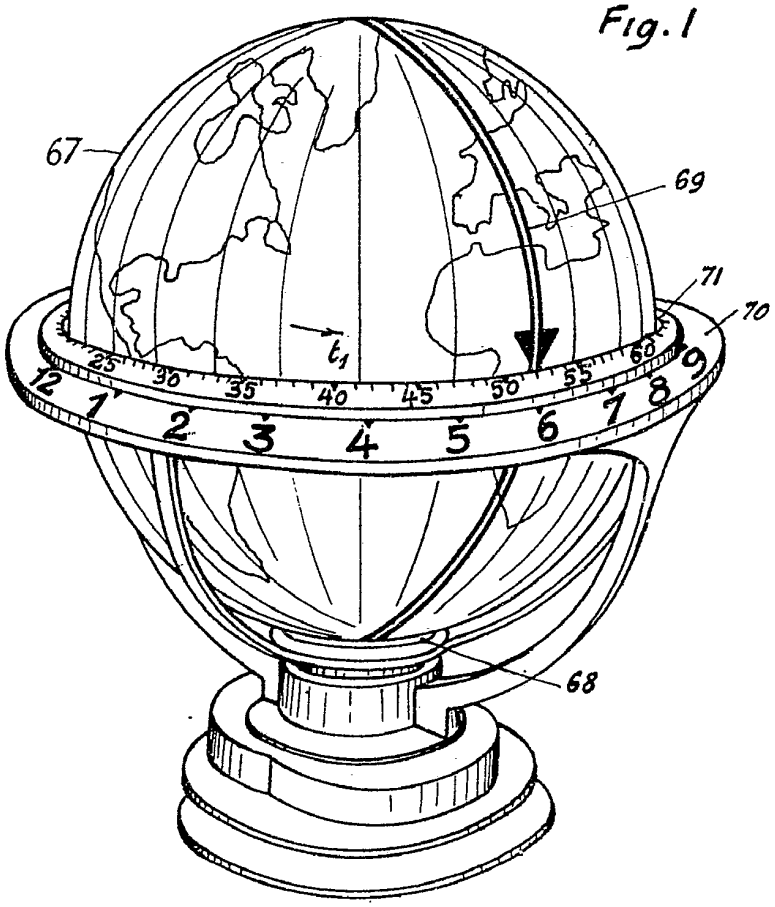


Fig. 3

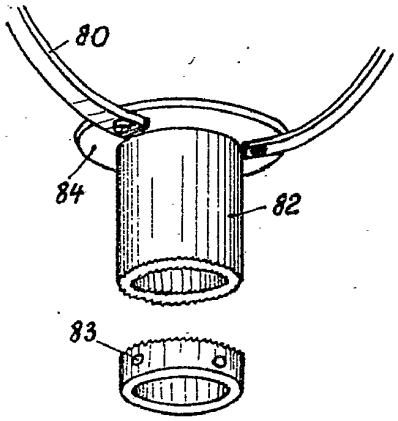
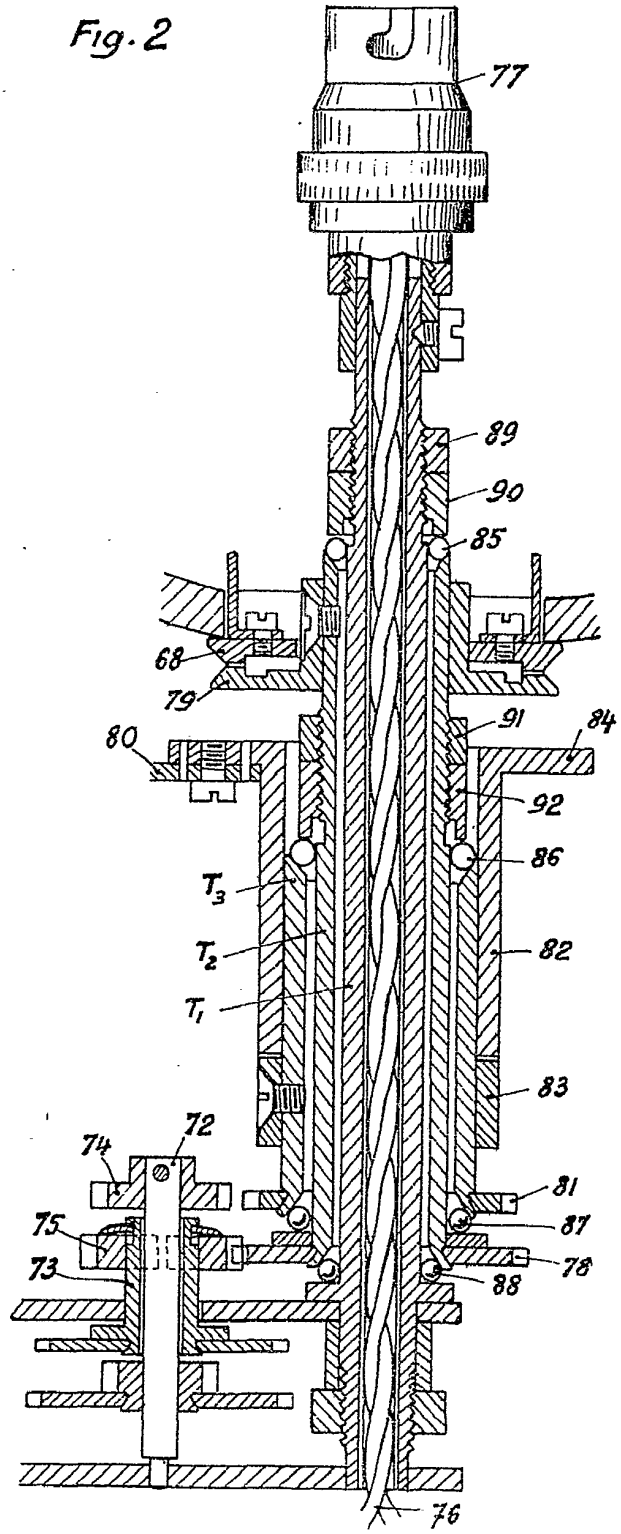


Fig. 4

70

Fig. 2



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441,854 COMPLETE SPECIFICATION

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

Fig. 1

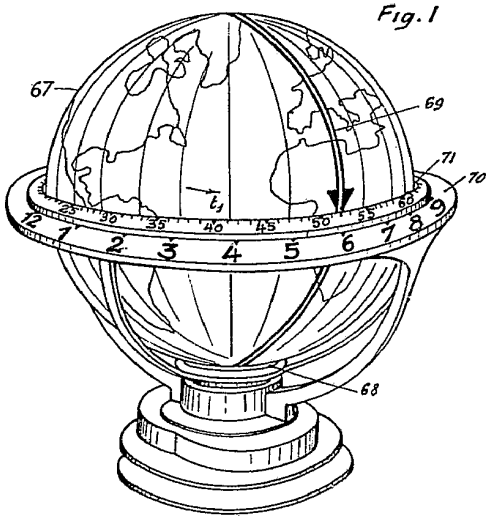


Fig. 3

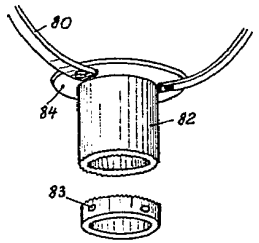
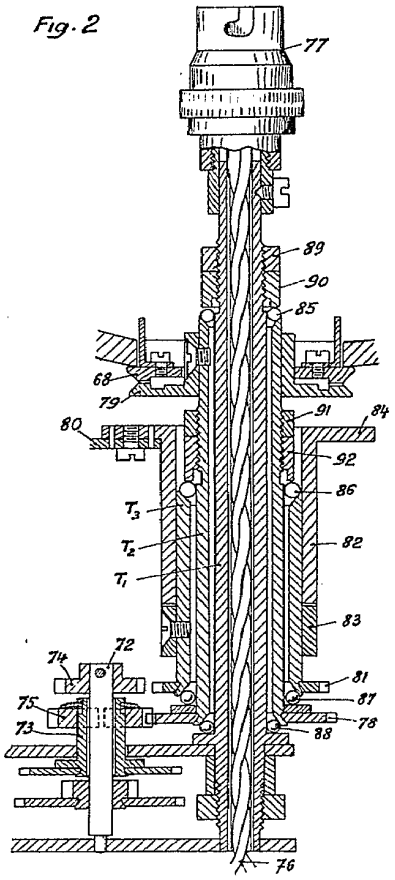


Fig. 4

Fig. 2



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