N° 7701 A.D. 1903

Date of Application, 2nd Apr., 1903—Accepted, 17th Sept., 1903

COMPLETE SPECIFICATION.

Improvements in Electric Receiver Clocks.

I, JOHANNES WILHELMUS HUYBERT UYTENBOGAART, Engineer of 2 to 4 Plompetorengracht, Utrecht, Kingdom of Holland, do hereby declare the nature of my said invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to electric receiver clocks, *i.e.* to electric clocks which do not contain a store of energy for driving them, but are dependent for their action on electric currents periodically transmitted to them from a main clock or transmitting instrument. The invention relates more particularly to that class of clock in which the movement of the hands is derived from rotating armatures. In the clocks of this kind hitherto constructed, the permanent magnets are liable to gradually lose their magnetism and the object of the present invention is to obviate this disadvantage. This object is attained in the present case by arranging the permanent- and the electromagnets so that the former are always kept closed by the cores of the latter.

In order to render the present specification easily intelligible reference is had to the accompanying drawing in which similar letters of reference denote similar parts throughout the several views:—

Fig. 1 is a sectional face view of the clock taken on line A—A of Figure 2, Fig. 2 is a horizontal section taken along the centre line of the rotating disc and Figs 3 and 4 are sectional face views of a modified form of the invention showing the magnets in two different positions.

Referring first to Figures 1 and 2: The two electromagnets *b* and *c* are mounted on the stationary plate *a* and the windings of these magnets are arranged so that the current impulses coming from the main clock, will excite the same to form poles of alternating polarity in a circle as will be seen from Figure 1. The permanent magnets *e* and *f* are mounted on a rotary disc *d*, the poles of these magnets being also arranged alternatingly in a circle. In the device illustrated in Figures 1 and 2 the permanent magnets are mounted outside the electromagnets whilst in Figures 3 and 4 the arrangement is reversed, the electromagnets being outside the permanent magnets. The electromagnets are adjusted in both cases so that the poles formed on the passage of the current will be of similar polarity to that of the poles of the permanent magnets lying opposite to them, so that on each current impulse, repelling force will be generated. The disc *d* is provided with a ratchet wheel *h* controlled by a pivotally supported pawl *i* and this wheel is adjusted on the disc so that the points forming the actual poles will not lie radially opposite to each other, but are slightly displaced, so that the repelling force will result in a tangential component acting in the direction of rotation of the disc *d* and adapted to turn the same a quarter of a turn.

Thus as illustrated in Figure 1 on an impulse being imparted to the electromagnets, the poles N N and S, S of each pair of magnets will repel each other and cause the disc *d* to rotate in the direction of the arrow *x* (Figure 1) and, when a slight movement of the disc has taken place, the poles S of the electromagnets will attract the poles N of the permanent magnets, thus assisting the rotative power. In intermittent rotation, the impulse will now cease, but the

[*Price* 8*d.*]

impetus of rotation will cause the rotary parts to go slightly further than the quarter of a turn intended, and the pawl *i* and ratchet wheel are timed to coact so as to arrest the rotary member in a position corresponding to the position of the parts originally determined, but a quarter of a revolution further on. The next impulse will reverse the poles of the electromagnets so that again similar poles of these magnets will be in proximity to the same poles of the permanent magnets and, owing to the lead of two of the poles of these pairs of magnets, the impulse will produce a further rotation of a quarter of a turn and so on.

The path of the lines of power is illustrated in Figures 1, 3 and 4 in a dot and dash line and it will be seen from these figures that the permanent magnets are kept constantly closed by the electromagnets, in whatever position the former happen to be.

The rotating disc *d* transmits its motion in the known manner by means of the pinion *k* to the clockwork.

The present clock is not only suited for currents of low density but may be easily adapted for currents of high density.

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

1: In a receiver clock of the class specified comprising moveable permanent magnets and stationary electromagnets, the combination of means for retaining the permanent magnets closed whilst they are not moving, substantially as described.

2: In a clock of the class specified the combination of moveable permanent magnets and stationary electromagnets, both sets being arranged in concentric circles and means for retaining the permanent magnets closed by the electromagnets when the former are not moving substantially as described.

3: In a clock of the class specified, the combination of moveable permanent magnets and stationary electromagnets, means for retaining the permanent magnets closed when not moving and means for imparting tangential movement to the said moveable magnets when they are repelled by the energizing of the electromagnets substantially as described.

4: In a clock of the class specified, the combination of a set of moveable permanent magnets arranged in a circle and having their poles alternating in polarity, a set of stantionary electromagnets arranged in a concentric circle and also having their poles alternating in polarity, and means for retaining the said permanent magnets closed by the electromagnets between the movements of the former substantially as described.

5: In a clock of the class specified, the combination of a set of moveable permanent magnets arranged in a circle and having their poles alternating in polarity, a set of stationary electromagnets arranged in a concentric circle, means for arresting the moveable magnets after each impulse, means for imparting similar polarity to each member of the pairs of opposing poles of the moveable and stationary sets, means for retaining the permanent magnets closed after each impulse and means for imparting tangential movement to the moveable magnets on each impulse substantially as described.

Dated the 2nd day of April 1903

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Agents for the Applicant.

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UYTENBOGAART'S Complete Specification.

(2 SHEETS)

SHEET 1

Fig. 1.

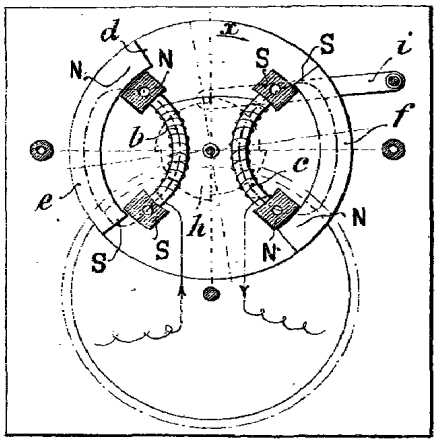
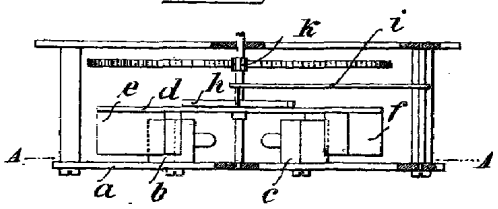


Fig. 2.



SHEET 2

Fig. 3.

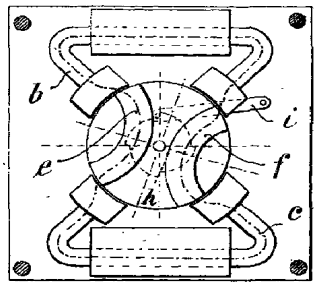
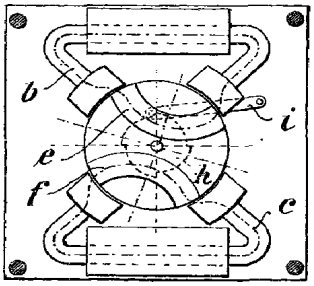


Fig. 4.



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

Fig. 1.

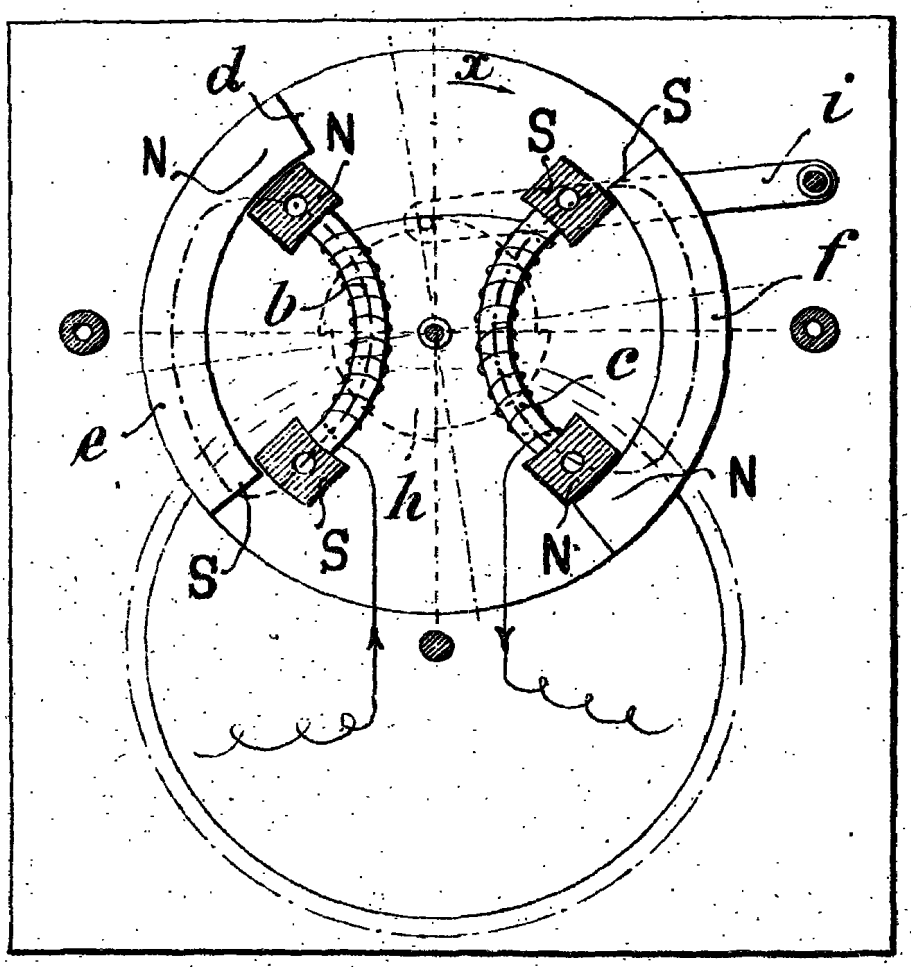
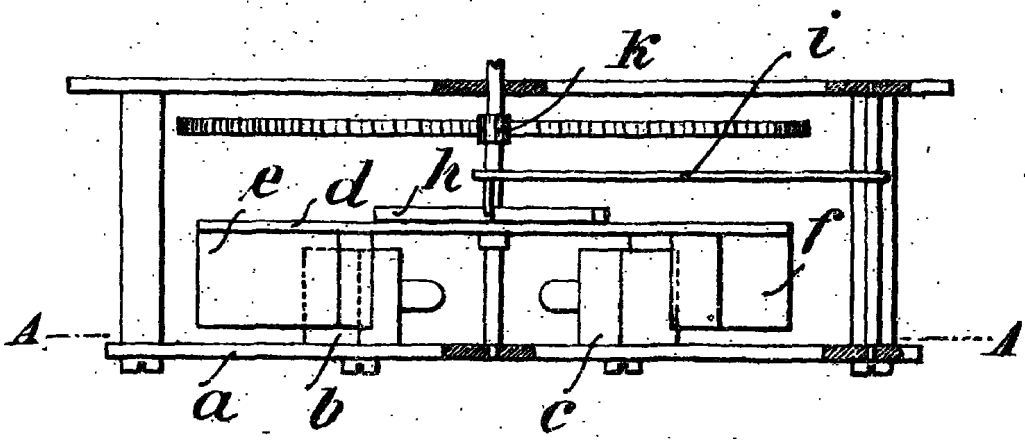


Fig. 2.



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SHEET 2.

FIG. 3.

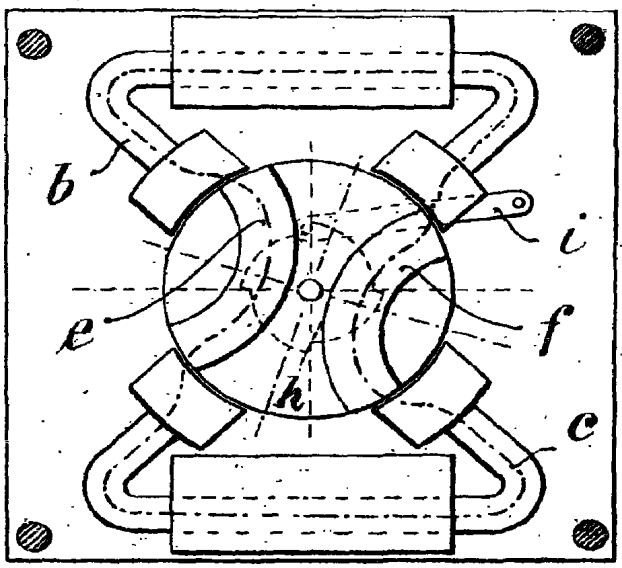
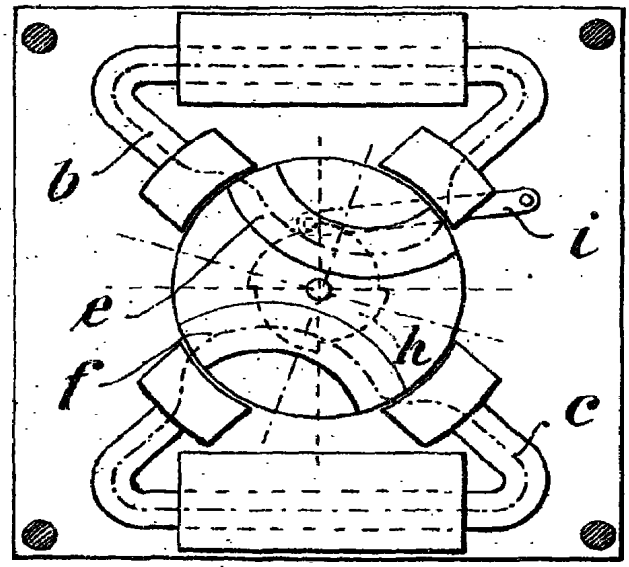


FIG. 4.



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