New Electric Clock

DAVID PERRET'S PATENT

On August 13th 1902 a Limited Company was formed at La Chaux-de-Fonds (Switzerland), to acquire the valuable Patents in connection with David Perrets Electric Clocks and also the sole right of sale for all countries, as the Inventor wishes to devote the whole of his time to the manufacture of the clocks.

The Cº are now prepared to supply clocks of all kinds from the cheaper grades that regulate within a minute a month to the finest clocks which regulate to one hundredth of a second and which are suitable for Observatories and other Scientific Institutions.

The inventor, Colonel David Perret, is a Watch Manufacturer and Electrician, having studied at the Federal Polytechnic School at Zurich and is well known as one of the best and most practical Watch Manufacturers.

He is the Inventor of several instruments in connection with Watchmaking and obtained First Prize in a competition opened in 1877 by the „Société intercantonale des industries du Jura" for the construction of a new instrument for measuring thicknesses for the special use of Watchmakers and was,

Member of the Jury at the World's Exhibition held in Paris 1878 for Watch and Clock Manufacturing.
President of Class III and member of the „Jury supérieur" at the World's Exhibition in Paris 1889.
President of the Jury for Watch Manufacturing at the Swiss National Exhibition held in Geneva 1896.
President of Class XV and member of the „Jury supérieur" at the World's Exhibition in Paris 1900.

David Perret's Electric Clock is wound up automatically by a feeble current supplied by two dry cells at regular intervals of one minute, which lasts for about $^1/_{300}$th part of a second. The consumption of the cells is therefore very limited.

The durability of the cells depends upon their size. With the present normal size the cells are guaranteed to work for three years, and we believe in most cases the cells will last considerably longer. In fact we may mention we have clocks which have been going since 1899 the cells of which are far from being expended.

When the cells are used up, they can be replaced at small expense by any person. Directions for this purpose are supplied with each cell.

Complete Insulation of the Clock work. — The electric system is combined in such a way as to prevent the currents passing through any part of the clock work. The current touches fixed pieces or springs only, and in no way the working parts; thus there is no fear of the pivots becoming oxydised.

Excellent contacts. — There are two contacts, carefully thought out so as to prevent oxidization, the one opening the current and the other breaking it, hence the absolute security in the working of the clocks. The contacts of our clocks never need cleaning.

Extreme simplicity. — The simplicity of the entire mechanism is such that it cannot be surpassed.

David Perret's Clock are especially suitable for the transmission of time for Public Institutions, Post and Telegraph Offices, Hotels, Barracks, Railway stations, Factories, Theatres, Hospitals, Schools, etc.

Accurate Time. — The spring which replaces the barrel is extended every minute so slightly that the motive power is practically constant. This spring acts directly upon the minute wheel, thus the number of wheels is considerably lessened and no part is subject to a great strain such as is experienced with the barrel spring of an ordinary clock wound up for 8 or 15 days. — Watchmakers will immediately realize that this arrangement greatly facilitates the regulating of clocks.

As a matter of fact the result is surprising; it was first noticed in 1900 at the Neuchâtel Observatory with an ordinary wooden pendulum-clock.

This clock remained at the Observatory for nearly one year and its daily variation never exceeded eight hundredth of a second.

The Director of the Neuchâtel Observatory, the late Dr. A. Hirsch, in his report says:

> „The attempts which I have made for several years to construct a second Hipp-Clock not having given „satisfactory results, I hope to succeed shortly with the new electric clock system invented by M. David „Perret, Member of the Observatory Committee. The ordinary clock which he has placed in the Observatory „for the time being to try his system, has given such surprising results during several weeks that we have „every reason to hope that this system when applied to a clock with a pendulum of ferro nickel, will „compete with our Hipp-Clock as to precision."

Death prevented Dr. Hirsch from witnessing the realization of his hopes and from seeing **the new astronomical clock David Perret placed in the Neuchâtel Observatory where it is employed for the transmission of time-signals to the different stations in Switzerland.**

With ordinary temperature and pressure its daily variation never exceeds the three or four hundredth of a second and it keeps as good time as the other clocks in the Observatory under constant pressure. So states the present Director of the Neuchâtel Observatory, Dr. L. Arndt. (See certificate.)

Some of the pendulum clocks of ordinary make, tested at the Observatory have given excellent results. We reproduce an Observatory certificate still signed by the late Dr. Hirsch.

3. Variation in the position of the sundry contact pieces by wearing caused by the oxydization of the contacts, if these latter ones are made chiefly by friction.
4. Opening and closing of the circuit at one point hence oxydization of the contacts by the spark of rupture, the oxidization of which being thus more frequent on account of the opening and closing of the electric circuit done on one same place.

The electric motor David Perret the particular character of which consists in one double circuit, awid all the defects described above.

Actually it is the disposition requiring the smallest quantity of electrical power and which acts with the most constant force on the movement of the clock.

Testimonials.

Neuchâtel, October 4th 1902.

I hereby certify that the Astronomical Pendulum Clock, system Perret, has been going at the Neuchâtel Observatory since April 1902 to my entire satisfaction, transmitting the time-signals to the different stations in Switzerland. Previons to this date and during six weeks (February-March 1902) the daily working of this clock was tested by the observation of the stars withe astronomical telescope. These observations have proved the perfectness of the construction and accuracy of David Perret's electric Clock. **The regularity of its daily working during that time was equal to that of a first class astronomical clock.**

After having definitely placed the mechanism for advancing or putting back the hands of the clock, necessary for the daily transmission of accurate time, the clock has again continued its regular course, which is so much the more remarkable as this daily operation is not without influence in the working of clocks.

signed **Dr. L. ARNDT,**
Director of the Observatory.

The undersigned, chief of the "Département des travaux de la Direction Générale des chemins de fer fédéraux„ at Berne, certifies that Mr David Perret Son, Watch and Clock manufacturer at Neuchâtel, has installed two plants of electric clocks in different offices of the "Direction Générale„ at Berne (rue Christophe 7 and Rue des Remparts 4 & 6). The first plant consisting of a regulator and four secondary clocks installed in September 1901, the second consisting of one regulator with ten secondary clocks. The installation took place in May 1902.

The two plants are giving entire satisfaction, the second never having stopped nor experienced the slightest defect from the moment it was started. The system is to be recommended owing to its simplicity the clocks having kept going until now, although left entirely to themselves.

For the Direction Générale des chemins de fer fédéraux :
signed **SAND.**

Neuchâtel, October 17th 1902.

We have great pleasure in certifying that the electric clock installed in the hall of our establishment on April 10th 1901 by Mr David Perret Son, at Neuchâtel has only varied one minute from January 16th to June 10th of this year.

The clock keeps excellent time although it is placed above a door which is being continually opened and shut.

The electric cells have not been renewed since their iustallation.

We are perfectly satisfied with Mr Perret's Clock.

BANQUE CANTONALE, NEUCHATEL :
The Manager,
signed **CHATELAIN.**

Lausanne, October 4th 1902.

Having made a trial of your system of electric clocks with an ordinary clock in the Town hall of Lutry, also with a regulator in the commercial house of Mssrs Bonnard frères at Lausanne, I can testify to the excellent working of both these clocks.

I have no doubt that your system will speedily get known seeing the many advantages it combines.

I wish to tender you my best thanks for the attention you have given to the execution of my orders and beg to remain etc.

signed **Jacques REGAMEY,** architect.

LITH.-TYP. R. HAEFELI & CO. - GNX-DE-FDS.

Description of the Electric Clocks

David Perret's Patent.

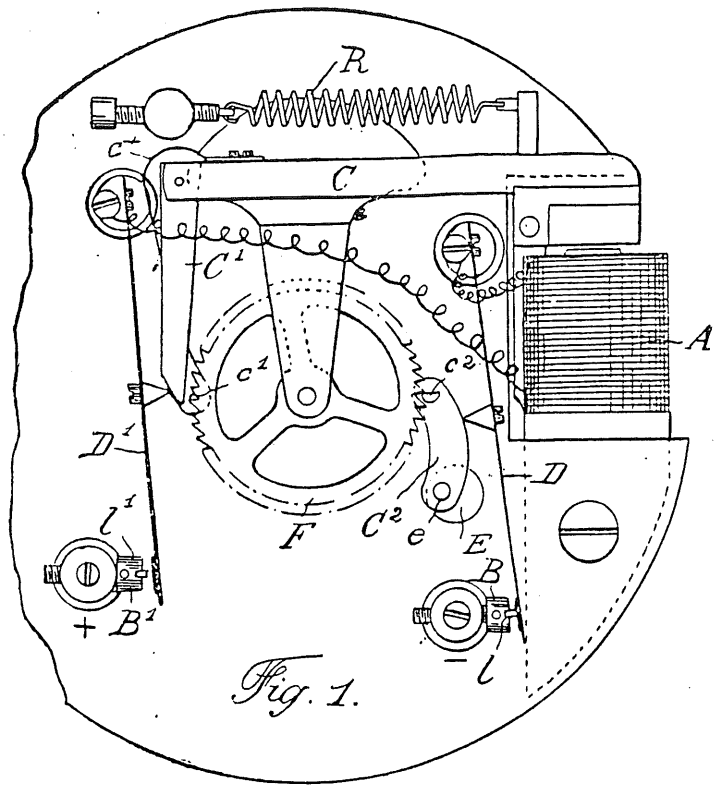


Fig. 1.

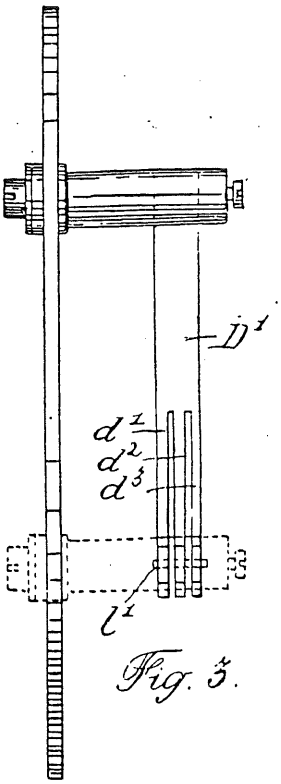


Fig. 3.

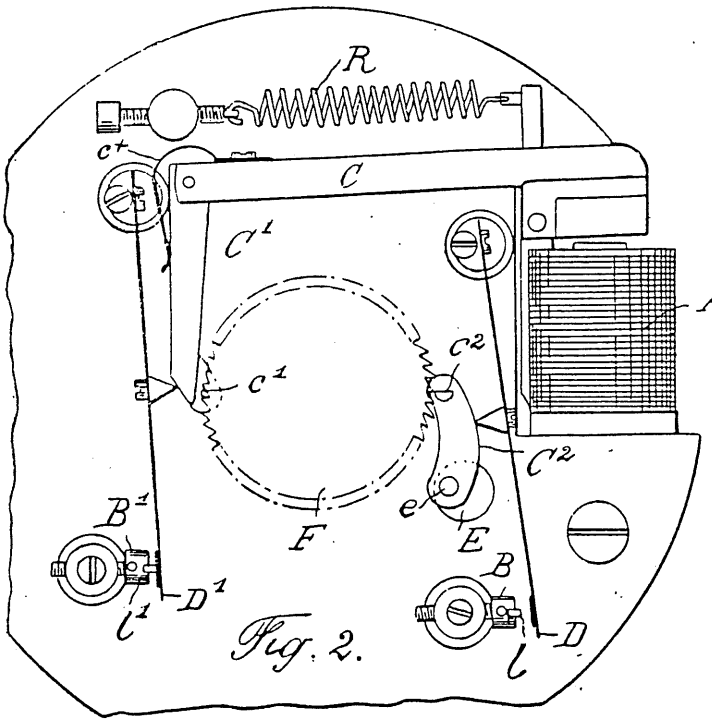


Fig. 2.

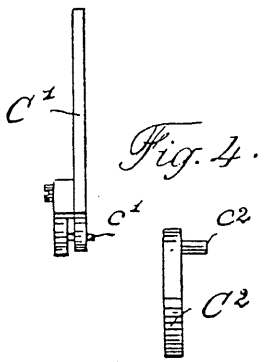


Fig. 4.

These electric clocks are an application of David Perret's electric motor, patented in Switzerland, Germany, United ates N. A., France, Great Britain, Austria-Hongria, Russia, Italy, Spain, Portugal, Belgium, Sweden, Norway, &c., &c.

The motor may be applied to all kinds of, pendulum and spiral clocks and is operated as follows:

A ratchet wheel *F* (figs. 1 and 2) receives a forward push tooth by tooth from the spring *R*, which is armed by an ctro-magnet *A*, every time the ratchet wheel *F* has advanced one tooth, and when the two springs *D* and *D*¹ are both contact with the pillars *B* and *B*¹.

Fig. 1 shows the disposition of the mechanism at the time the spring R has been armed by the electro-magnet; fig. 2 at the time when the spring is about to be re-armed. The ends of the conductor of the electro-magnet A are bound one to the contact spring D^1, the other to the contact spring D. The armature C of the electro-magnet carries a click C^1 whose use is to push forward the ratchet wheel F. The click C^1 is pressed against the ratchet wheel F by a spring c^* in order to reduce the presssure of the spring D^1 and to reduce the pressure on the click.

When the extremity of the armature C is acting on the pressure of the spring R, the click C^1 presses the contact spring D^1, which is part of the circuit of the electro-magnet A, against the contact piece l^1 of the pillar B (fig. 1) in such a manner that the circuit is closed, when at the end of that action of the spring R (fig. 2), the spring D comes in contact with the piece l of the pillar B^1. The springs D and D^1 are then at the same time in contact, the first with the contact piece l, the second with the contact piece l^1.

The pillar B is united with one of the poles of one or two of the cells, and the pillar B^1 with the other.

The pillars B and B^1 and the other two where the springs D and D^1 are fixed are isolated from the mechanism.

The spring D is left free to come and butt against the pillar B or is kept back from it by a second click, C^2, the pivot of which is fixed eccentrically on a button E, which can turn on the plate on the disposition.

The pivot of the click C^2 can then be placed more or less high in turning the button E.

The clicks (fig. 4) C^1 and C^2 do not gear directly by their ends with the ratchet wheel F, but are provided with a lateral pin, the section of which is chosen after the functions fulfilled by the click.

The pin c^1 of the click C^1 is cylindrical in order that the rubbing between the pin and the teeth of the wheel (ratchet) F should be reduced to a minimum.

The pin c^2 of the click C^2 is half cylindrical, so as to be easily raised by the teeth of the ratchet wheel F without pressing too hard the spring D.

A too great tension of the spring D must be avoided, because the ratchet wheel F would feel too great a resistance in its movement.

The contact springs (fig. 3) D and D^1 have each several blades, which at the moment of contact are in different planes although very near one another.

The ends of the blades are coated with thin silver covers or platinum or inoxidizable metals, the contact taking place thus by pression.

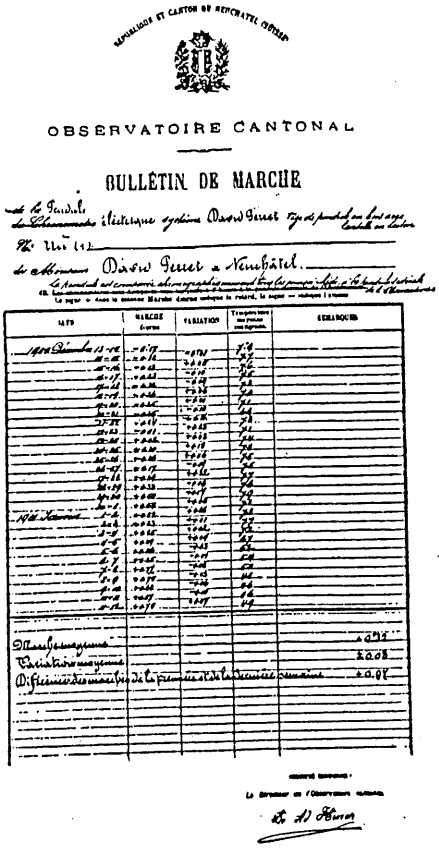
As in contact these different blades are not on the same plane, it follows that one, d^2 for instance, will leave the contact the last, and therefore will be the only one to receive the spark of rupture, and will be the only one that will get oxidized; but in spite of that oxidization the contact will be well made by the other blades d and d^3 that will prevent the trouble so often present in other mechanisms.

If instead of oxidization it was a question of dust, the multiplicity of the blades would fulfil the same object as in the case of oxidization.

Such is the disposition of the electric motor which Mr D. Perret applies to clocks, that, if desired, the Spring R can be replaced by a weight or any kind of accumulator; the pillar B and B^1 can also be replaced by a single one on condition they have their two contacts in different places.

Up to the present the disposition of electric motors used in electrical clocks have all had different causes of rapid wear or irregularity of going, among which we may mention the following:

1. The closing of the electric current longer than is necessary, hence useless wear of electrical force.
2. Oxidization of the pivots of the disposition, if the current passes through the pivots of the disposition.



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