Adolphe Nicole and the True Beginning of the Modern Chronograph

By Philip Poniz (NJ)

The second in the Fact or Fiction column that will analyze questionable horological claims, this article examines the opinion among past (and present) horologists regarding the origin of the chronograph. Among all horological complications, the chronograph is the one most often applied to watches. Yet, its origin has been misunderstood for almost two centuries. This article takes on the challenge of rewriting horological history on this matter.

Introduction

A modern chronograph is a regular watch that has an additional mechanism that can measure time intervals. For this it needs four components: (1) a timekeeper, (2) seconds counting mechanism, (3) a coupling mechanism (usually a clutch) connecting the timekeeper with the counting mechanism, and (4) a return-to-zero mechanism.

The following are predecessors of the modern chronograph:

- Watches from the 17th century with seconds, satisfying either 1 or 2 (with manually 4) of the above components but not both.
- Starting in the first quarter of the 18th century, watches only satisfying 1 and 2 (with manually 4).³
- Independent seconds watches satisfying 1, 2, 3, and manually 4 (from 1776).
- Timers or counters (from circa 1800), satisfying only 2 (with manually 4)—what the French call compteurs. Compteurs measure time intervals but do not show time, and the early ones almost never had return-to-zero ability.⁴ They are still produced today. The modern timers almost always have the return-to-zero function.

Figure 1. Patek Philippe chronograph Ref. 1463-869014, with a controversial 9-minute scale that was designed to aid navigation but was also used for timing eggs or phone calls. This is another story that may be included in a future Fact or Fiction column. The particular chronograph shown here was used by the owner of an ex- Presidential yacht, the floating equivalent of Air Force One.

Figure 2. Rarely seen French version of Nicole's 1862 patent. It was applied for on November 13 and protected retroactively from May 14, the same day as the British patent. SOURCE: ARCHIVES INSTITUT NATIONAL DE LA PROPRIÉTÉ INDUSTRIELLE (FRANCE).
The modern chronograph, such as the one in Figure 1, started its life on May 14, 1862, after the publication of Adolphe Nicole’s patent No. 1461 (Figure 2).

At the time, Adolphe Nicole (1812–76) had a partner, Jules-Philippe Capt (1813–circa 1881), and together they traded in London as Nicole & Capt (1839–76). In 1862, at the London Exposition, they presented the world with what we consider today to be the foundation of the modern chronograph. This invention was a huge step in the field of horology. Seventeen years after the patent was issued, a noted Swiss horologist and author of *Enseignement théorique de l’horlogerie,* Joseph Rambal, wrote in the *Journal Suisse d’horlogerie:* 

[W]e must mention here the name of the one to whom this ingenious mechanism is due. It was to one of our compatriots, the late Mr. Adolphe Nicole, originally from the Vallée de Joux, who had lived in London for many years that we owe the invention of the chronograph.

The mechanism, which is placed under the dial, was simple, reliable, and could have been installed on any regular watch with almost no alterations to the original movement. In other words, the chronograph mechanism that could have been produced as a module could have also been installed on any regular timekeeper with minimal alterations to the other parts of that timekeeper.

The production of Nicole’s design started in the UK, where it was used into the 20th century even after alternative, better constructions had been invented. The Swiss picked up the idea very quickly, probably still in the first half of the 1860s, and some of their ébauche companies produced Nicole’s type of chronograph for the next 25 years. It is unknown if Nicole was paid by the Swiss manufacturers or not.

One of those Swiss manufacturers was Piguet Frères, a well-known blank movement company. Its earliest chronograph of this type that I know of is from 1869, but the company must have started making them before 1869. I have one that is still installed on a key-wound movement shown in Figure 3. This indicates that Piguet Frères most likely had started making them earlier. Figure 4 shows Nicole’s design. The Piguet construction is virtually identical. The watch most likely dates from...
the first half of the 1860s, shortly after Nicole’s patent was issued. In 1872, Piguet Frères charged 124 CHF ($24 USD)\(^9\) for such an ébauche, while its chronographs that were fixed on the back plate (chronographe en vue) cost 165 CHF ($32). Its competitor, Lecoultre-Borgeaud Co., charged 137.50 CHF ($26.50 USD) for en vue ébauche.

The under-the-dial system was easier to make and, consequently, cheaper. However, it was more difficult to service, which led to the design being abandoned in favor of the en vue one. Because of the low cost, the Swiss produced them at least until 1884, and the British made them even throughout the first quarter of the 20th century. In the early 1880s, Piguet Frères charged only 115 CHF ($22) for such an ébauche.\(^10\) The French also jumped on the bandwagon, producing Nicole’s chronographs while changing the clutch to a compounded one (Figure 5). While the Swiss moved the chronograph mechanism to the back plate for the Continental and American markets (Figure 6), they kept it in under the dial (Figure 7) for the British market.\(^11\)

**The Fiction of the “First” Chronograph**

Horological historians have always known that Nicole already had an idea for a chronograph in 1844, 18 years before his patent of 1862. He applied for a British patent on October 14, 1844 (enrollment date of April 14, 1845), which was granted under the number 10,348 (Figure 8).\(^12\) It provides a relatively clear description of his chronograph invention, yet its mechanism has been widely misunderstood. This misunderstanding led to incorrectly attributing the invention to the 1862 patent and not the 1844 patent. Joseph Rambal stated in his 1879 article:

> The mechanism just mentioned [in the 1862 patent] was not Mr. Ad. Nicole's first creation. For a number of years now, his house [company] had been manufacturing chronograph watches fitted with two large superimposed seconds hands, called split seconds, which offered the following peculiarity: the two hands, after having been stopped successively, not only could be placed one under the other, but resumed on the dial the place they would have occupied if the stop had not taken place. This last effect was produced by an ingenious arrangement called a pen nib [coupling].\(^13\)

It is correct that Nicole & Capt did make split-seconds watches (without return to zero) as early as the late 1840s, based on Winnerl’s idea.\(^14\) However, Rambal apparently

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**Figure 6.** Swiss chronograph movement with the chronograph mechanism moved to the back plate, based on Nicole’s 1862 patent.

**Figure 7.** Swiss chronograph blank movement for the British market, based on Nicole’s 1862 patent.

**Figure 8.** Nicole’s original 1844 patent drawings of his chronograph.
did not know that Nicole had already made a working chronograph with a return-to-zero function in 1844.

Even the Swiss watch bible, Technique and History of the Swiss Watch, written in 1953 by two of the best Swiss horological historians, Eugène Jaquet and Alfred Chapuis, missed the fact that the return-to-zero chronograph was an 1844 invention:

The first chronograph mechanism in which the hand returns to its starting-point was shown at the London Exhibition of 1862, by the firm of Nicole & Capt. These were Swiss watchmakers, whose factory was at Le Solliat in the Valley of Joux, and whose founder, Adolphe Nicole, had settled in London.¹⁵

In Germany, Gerd-Rüdiger Lang and Reinhard Meis stated: “Thus, the chronograph in the form of a pocket watch has been known since 1862....”¹⁶ Nicole produced, maybe not a perfect, but definitely a usable chronograph in the form of a pocket watch already in 1844, not in 1862. Lang and Meis’s compatriot Andreas Fritsch, in an otherwise very good work, wrote: “This invention of the chronograph goes back to Adolphe Nicole. He created the first zeroing device in 1862 and registered it for a patent in England as the ‘chronograph with zeroing mechanism.’”¹⁷ Nicole created the first zeroing device in 1844. In fact, he did not create it—he employed one that already had been created.

The French concurred with those misstatements. In their famous Horlogerie théorique: cours de mécanique appliquée à la chronométrie, the Grossmans posited: “The invention of the chronograph goes as far back as the year 1862 and is due to Adolphe Nicole, originally from the Valley de Joux but established in business in London.”¹⁸ Here again is the incorrect account of the origin of Nicole’s chronograph, which goes back to 1844, not 1862.

La Montre Française claims the same. It has no mention of Nicole’s 1844 invention, adding that “the inventor of the chronograph is not known for sure.”¹⁹

The impression is not much different even in England, the home of the invention. The famous Watch & Clock Makers’ Handbook, Dictionary, and Guide, written by F. J. Britten (1843–1913) and later revised by Richard Good, the British Museum Curator of Horology, asserts: “The first chronograph with fly back hand was introduced in 1862 by Adolphe Nicole.”²⁰

The first chronograph with a fly back hand was introduced in 1844, not 1862. In their book Watches, George Daniels and Cecil Clutton claim the same: “The fly-back chronograph was produced by Nicole & Capt in 1862.”²¹ Yes, it was, but it also occurred 18 years earlier in 1844.

The above evidence does not characterize the beliefs of all horological historians. There are some who have realized that Nicole’s 1844 patent was the beginning of the chronograph. For instance, Henry Fried acknowledged Nicole’s 1844 priority on the occasion of receiving a “Heart Cam” medal.²² None of them, though, explained what the 1844 invention was really about. The vast majority, as shown above, misinterpreted it or just neglected to mention it. This is particularly mysterious taking into account the fact that in 1896, the Swiss branch of the company, Capt & Meylan, wrote: “Mr. Adolphe Nicole, already in 1844 took out a patent for a watch with a seconds hand starting from a point, stopping at will, and returning to its starting point. In 1862 he took a second patent for an improved chronograph.”²³

Nicole’s 1844 Chronograph Patent

To the best of my knowledge, this article is the first detailed explanation on how the original chronograph worked. The description below is based on the patent drawings and text and on my notes when I examined Nicole’s 1844 chronograph. The drawings are Nicole’s, and my revisions reflect the elements of the real chronograph I examined. Most of the levers and springs had different shapes and locations. I added to or changed Nicole’s drawings only what I deemed necessary, leaving the schematics as close to his as possible.

The watch was in a gold open-face case with going barrel. It was stem wound and stem set. The pendant was straight. The setting was in both directions but in one direction the watch was also being wound. Once fully wound up, the setting was only possible in one direction. It had a duplex escapement with Nicole’s overbanking protection. The chronograph mechanism was on the front plate under the dial (the same as in his later 1862 design). The enamel dial was signed Adolphe Nicole, not the customary Nicole & Capt. The hours and minutes were on a subsidiary dial at the top of the face of the watch.

The watch had two center seconds hands. The first impression was that it must be a split-seconds chronograph.²⁴ However, it was not: one of the hands was a regular sweep-second hand running with the train. The other was a normal chronograph hand with start/stop/return-to-zero. The zeroing was via a heart cam.

The case had a bolt on its band for the chronograph activation. It was arranged like a repeater’s slide; the bolt had an inner slide to which it was attached by a screw. Besides activating the chronograph, it had another function: when activated, the other end slid under the zeroing push button, blocking it. The purpose was to make sure that the zeroing push button could not be activated when the chronograph was running. Nicole did not pay much attention to the activation means in his patent application: “The lever i (zeroing lever) as well as

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the lever \( l \) (start/stop) may be moved from the exterior of the case, or by any other means” (see Figure 11).

The chronograph hand could be started and stopped and started again as many times as desired. This allowed the timing of a set of events where the score was the sum of individual races.\(^{25}\)

**Description of Nicole’s 1844 Patent**

The train is arranged such that the 4th wheel (the seconds wheel) is located in the center of the watch. Its arbor \( a \) carries a center sweep second hand \( f' \). It is driven from the 3rd wheel, which gears with a pinion \( a \). The lower part of the arbor is pivoted in the back plate not shown in the drawing. It carries the 4th wheel, which drives the escape wheel. It is a regular direct-sweep second mechanism that is running with the train (Figure 9). Nicole described it as follows: “\( f' \) is the ordinary second-hand fixed upon the pivot, which continues always its course.”

The arbor \( a \) is friction fit with the wheel \( d \), which is more of a disc than a wheel. In the watch it did not have teeth and was made of steel.

The heart-shaped cam \( e \) is riveted to a sleeve \( e' \) revolving over the arbor \( a \) freely. In the watch the sleeve was made of steel. The top of this sleeve carries the chronograph hand \( f \). The sleeve and the heart can also move freely up and down over the arbor \( a \). In the original drawing (see Figure 8) it appears that the heart has something that looks like a wire \( x \) fixed to it and goes to the disc \( d \). The watch did not have anything like that. It is possible that it is a poor drawing of the zeroing lever \( l \).

The bottom surface of the heart and the top surface of the disc \( d \) were roughened to provide good friction when joined together. When the sleeve \( e' \) moves down, the heart \( e \) comes in contact with the disc \( d \), which carries it forward and the chronograph hand \( f \) is activated. The mechanism is a friction clutch that resembles the disc clutches used in today’s automobile industry (Figure 10). In high-torque applications, like car clutches, it has a weakness such as slippage and wear. In Nicole’s chronograph, since the torque is minuscule and because of the roughened surfaces, the slippage is nonexistent (unless subjected to jerky movements), and the wear, if any, is minor.

The up-and-down movement of the sleeve \( e' \) is facilitated by spring \( g \), which terminates between two flanges of the sleeve \( e' \). It is controlled by a lever \( l \) protruding through the case into the bolt outside the case (Figure 11). Nicole refers to \( l \) as a “lever or disc.” On one occasion, he erroneously called it \( k \). The spring \( g \) has its tension directed down, toward disc \( d \). While disengaging the chronograph, it is lifted by the lever \( l \) via the wedge \( w \) (Nicole called it a “projection”). When the bolt is triggered to stop the chronograph, the lever \( l \), which is pivoted over the screw \( s \), lifts the spring \( g \), and the chronograph is disengaged from the train. Sliding the bolt back reactivates the chronograph.

In the actual watch, \( g \) was a lever, not a spring. It was pivoted and poised, and pressed down by an additional relatively weak spring \( p \) (see Figure 9). It was almost identical to Rieussec’s lever that controlled the up-and-down movement of the pin-hand from his improved inking chronograph (see Figure 13). Lever \( g \) was perpendicular to lever \( l \).

The tip of the lever \( g \) was rounded and highly polished. Therefore, the friction between the tip of the lever \( g \) and the flange was small. A similar situation exists in split-seconds chronographs: when the split is stopped and the
chronograph is running, the split-seconds mechanism exerts continuous friction by constantly rubbing against the heart mounted on the chronograph arbor.

In Figure 12, \( h \) looks like a bracket with two prongs holding down the heart. Nicole describes it as: “\( g \) ... presses the cam wheel \( e \) slightly against the fixed piece \( h \), when the hand \( f \) is to be stopped.” When the chronograph is stopped, the lever \( g \) presses the heart against the elastic prongs of \( h \) and the chronograph hand is well secured. Otherwise, it could freely revolve over the arbor \( a \), as well as rub against the sweep second \( f' \). Today, we call it a brake lever.

Nicole also used the vertical clutch in his split-seconds chronographs based on Winnerl’s pen-nib coupling (without the return-to-zero function). I know of one such chronograph having a Cole escapement and date letter 1850–51. Apparently, the above-mentioned Rambal was aware of another. What is significant is that the idea of a vertical clutch stayed with Nicole for a while.

On the front plate there is a spring-loaded pivoted lever \( i \), which today we call a hammer (Figures 11 and 12). When activated by a push button, the hammer strikes the heart and zeroes the chronograph hand \( f \). The direct zeroing can be problematic. One could damage the heart or the arbor; however, the push button was flat and flush with the case when zeroing. Sometimes I needed to press it again because the first push did not go deep enough.

Twenty years later, in 1864, Paul Foucher patented a timer with an identical zeroing system.\(^{26}\) There are hundreds of his timers still around. Ten years later, Patek Philippe began using the same direct-zeroing system in its inking chronographs. This proves that the direct zeroing can work well. Some of Foucher’s chronographs had another of Nicole’s 1844 features—its accidental zeroing prevention device (Figure 12a). Nicole’s was automatic, Foucher’s manual. It is not difficult to imagine that Foucher might have been familiar with Nicole’s 1844 chronograph design.

The widespread misunderstanding of Nicole’s 1844 chronograph idea is puzzling. It might be because of a note written in the Nicole, Nielsen & Co.\(^{27}\) catalog from circa 1910, stating that they invented the chronograph in 1862. Apparently, by 1910 nobody there remembered the 1844 invention, which after the 1862 improvement was outdated and, therefore, forgotten. And many blindly followed, regardless of the patent’s explanation. It is surprising how quickly things can get forgotten. In 1883, Emile Nielsen, a son-in-law of Adolphe Nicole, wrote: “I read, in a patent issued to Mr. Nicole in April 1845, the description of a watch having, in addition to the ordinary second hand, a seconds hand that can start, stop and return to the starting point.”\(^{28}\)

Without a shred of a doubt, this was the very first workable idea of the modern chronograph mechanism. It was invented no later than 1844 when Nicole applied for a patent.
Rieussec/Fatton’s Inking Chronograph and Nicole’s 1844 Design

More often than not, in the history of technology, progress is a function of small steps. In the case of Adolphe Nicole’s 1844 chronograph, one cannot escape an impression that it was a natural progress of Rieussec’s inking chronographs. It was a huge progression: getting rid of the ink was a giant improvement. Yet, in both designs, the basic concept was based on a vertical engagement. Activating lifting levers were virtually identical, and as seen in Figure 13, L is Rieussec’s lifting lever, and in Nicole’s it looked pretty much the same. They were arranged and placed in the very same way. Rieussec’s complicated triggering mechanism W was substituted by Nicole’s simple lever L (see Figure 11).

The 1870s Chronograph Built on Nicole’s 1844 Idea

Leopold Huguenin experimented with chronographs in the 1870s and 1880s. He is best known for his independent split seconds, seen in jump quarter-seconds watches (foudroyante or diablotine) with the return-to-zero function. He also made a few single-train chronographs that are analogous to Nicole’s 1844 design. These are very rare today. The difference is that the friction is not created by Nicole’s disc-to-disc design but is a disc-to-spring design (Figures 14, 15, and 16). A wheel driving the chronograph pinion (Figure 16) revolves freely on the 3rd wheel arbor (like Nicole’s heart with the sleeve e’ on the 4th wheel arbor). The arbor has a steel disc fixed to it (similar to Nicole’s disc d to the 4th wheel arbor). The disc provides friction to the wheel via a spring fixed to the free revolving wheel (like Nicole’s disc provides friction directly to the heart).

Huguenin revised Nicole’s 1844 idea by moving the coupling to the 3rd wheel, which allowed him to get rid of the vertical arrangement. The difference between the weaknesses of each respective watch was that in Huguenin’s design the additional friction was present when the chronograph was not engaged, while Nicole’s only had this when the chronograph was engaged. What is important here is the fact that, about 30 years after Nicole’s 1844 idea, someone decided to base his chronographs on it. The simplicity of Huguenin’s chronographs (Figure 15) is remarkable.

Figure 13. Nicolas-Mathieu Rieussec’s inking chronograph mechanism, ca. 1835. PHOTO COURTESY OF ANTIQUORUM.

Figure 14. Leopold Huguenin chronograph built in the 1870s on a similar principle as Nicole’s 1844 design.
Comparing Nicole’s 1844 and 1862 Patents

There is no doubt that Nicole’s 1862 patent was more practical than his 1844 one. The change from a bolt and push button to a single push button was easier to operate, and the application of the chronograph functions control wheel (Figure 17), called a castle wheel today (or column or pillar wheel), was a huge step forward, regardless of the fact that Joseph Thaddeus Winnerl presented one 19 years earlier (Figure 18). The change from the vertical disc clutch to the secure horizontal one was also an improvement. Probably the most important change was that it could be built on any standard watch movement. The new design was picked up immediately by manufacturers all over the watch-producing world, while Nicole’s 1844 patent was not. Among the tens of thousands of watches that have come through my hands, I have only seen one based on Nicole’s 1844 patent.

Nicole had an inquisitive mind, proven by his 1844 patent and also by his other patents and watches. He experimented and was known to come up with unusual constructions. Figures 19, 20, and 21, showing a timer without a mainspring, are clear proof of that. F. J. Britten called him “a remarkably clever horologist.” For a person like Nicole, the lack of commercial success for his 1844 patent must have prompted him to improve on it. The 1862 patent would be a logical result.

The real question is why Nicole did not produce his 1844 idea commercially. The design worked and was relatively easy to produce. This mechanism was fragile, but in the hands of a careful operator it worked well. If I were horseback riding, I would not take it with me to time my ride because the jumpy movements could cause the clutch to briefly disengage. However, a spectator could time me without any problem. I took the above-mentioned Huguenin skiing, and while timing my ride...
down the mountain, it proved slightly less accurate compared to my friend’s quartz timer.

Nicole was very active in other areas besides watchmaking. He was a member of the Society of Arts, researched different alloys, and was involved in making musical instruments as was his father. He even worked with steam engines; on February 15, 1853, he was granted an English patent (no. 394) for “improvements in rotary engines.” Yet, the fact remains that Nicole did not make his 1844 chronographs in any commercial quantity. There are at least five reasons for that:

1. **Dependence on Dent in the very early days.** The earliest Nicole & Capt watches almost exclusively carry the name “DENT” on the dial and the movement. It is hard to find an early Nicole & Capt watch that does not bear Dent’s (and later also Frodsham’s) signature. Dent might have been Nicole & Capt’s only client, and if not the only one, then definitely the most important. Nicole’s written or unwritten contract with Dent to supply him with the keyless watches was the bread and butter of his business.

2. **The increased demand.** Dent’s exponentially increased demands for Nicole’s keyless watches, especially after the 1851 Exposition, must have created production problems for the few watchmakers Nicole had at the time. In 1841 Nicole & Capt only had four watchmakers working for them, including Adolphe’s brother. Therefore, Nicole had to set aside his chronograph idea to allocate his time to Dent’s orders.

3. **The lack of distribution infrastructure.** Nicole did not have a distribution infrastructure. If Dent, definitely a shrewd businessman, had hesitations about the chronograph, Nicole was very limited in his choices of where to sell it. This changed in 1862 when his company was well established and the production process could handle new challenges.

4. **The need to develop the production machinery.** Even though Nicole had the know-how to make machine-made parts from Ingold, with whom he had worked for some time, Ingold had not perfected his machines and so they were not a commercial success, as his French,

**Figure 19.** Nicole & Capt’s 10-minute timer.

**Figure 20.** Nicole & Capt’s 10-minute timer’s scale.

**Figure 21.** Nicole & Capt’s 10-minute timer’s movement. Notice the lack of a mainspring. It is wound by activation in the same way as the vast majority of repeating mechanisms.

British, and American attempts show. In order to satisfy the increasing demand, Nicole needed to improve the machines himself. As the results show, he did.

There is also another factor: the period from 1840 to the 1860s was revolutionary in terms of the change of factory power from water to steam. Nicole, realizing the power and the convenience of the steam engine (water power manufacturers needed to be close to a river), tackled
the problem and invented his own steam engine. There is no doubt that he must have put his mind also to the smaller improvements in his enterprise. Those efforts, judging by the increased output of his keyless watches, did work. All this must have taken considerable time and effort. Consequently, in the 1840s and 1850s Nicole did not yet have the production resources to organize the production of chronographs. I would not be surprised to learn that the 1862 chronograph improvement had been developed considerably earlier and kept secret until Nicole’s production and outlet infrastructures were well established. This is supported by a Capt & Meylan letter dated October 20, 1866, in which they wrote, “We cannot deny that Mr. H.-F. Piguet worked on chronographs during his stay in the house of Nicole & Capt in London from 1859 to 1861.”

5. Experience and success gained during the Exposition. For Dent, the 1851 exposition was a great success. He left with a Prize Medal and a Council Medal. Nicole did not leave with any medals, but his reputation, prestige, and orders increased considerably. The exposition must have taught Nicole that international exhibitions were a great way to promote products. After he improved his 1844 chronograph, it is reasonable to assume that he would have made sure that it was ready for the next large exhibition in 1862. But this time, Nicole’s work would not be shown through intermediaries, such as Dent, but by himself. And Nicole would have been right: the 1862 exposition was an instant success for him. Alternatively, if he had conceived his improved chronograph considerably before 1862, he might have waited for the exposition to announce it.

Conclusion: Fact or Fiction?

There is no doubt that the idea of a chronograph, in the modern meaning of the word, was created by Adolphe Nicole in or before 1844. Its technical solution of a vertical clutch was displaced by Nicole’s 1862 horizontal design with Winnerl’s castle wheel, which was the most important element of the patent (see Figure 17).

Regardless of those changes, the 1844 idea has survived. The above-described Huguenin watch is the best example of it. As for the vertical clutch, it found its followers among the best Swiss watchmakers. Louis Audemars, as well as Ami Lecoultre-Piguet, used it in a number of their watches. It was improved from the surface-to-surface clutch to the gear-to-gear one, but it was based on Nicole’s 1844 idea. The famous Ami Lecoultre’s Merveilleuse is such an example: its minute register is based on a vertical clutch. Nicole’s direct zeroing idea was also used later by others, such as Patek Philippe or Paul Foucher.

If you would take away only one idea from this article, it should be that the modern chronograph was invented and constructed by Adolphe Nicole in or before 1844.

Acknowledgments

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Notes and References

1. The old meaning of the word chrono-graph was a device that graphically marked time or time events. An inking chronograph is a small example of a variety of chronographs in the old meaning of the word.

2. There also existed, quite early, minute counting mechanisms. I know of one from the 1830s with a return-to-zero mechanism.

3. The earliest one known seems to be in the British Museum. It was made by Daniel Delander (Inv. No. 1958, 1201.837). The museum dates it 1720–25. It is described in detail in Antiquarian Horology (Summer 1999): 570–71.

4. They were based on a few different principles. The ones that were based on a heart cam were the predecessors of the modern chronograph. There are different opinions regarding the origin of the heart cam. This will be the subject of another article in this column. The story of timers goes back to the second half of the 18th century. One of the earliest ones, called compteur du tierces, by Louis Moinet has survived. There exist even earlier ones.

5. Unless otherwise noted, all photos are mine or are in the public domain.

6. Horological literature is full of conflicting information about the history of Nicole & Capt. This is about to be corrected; Tony Maragna is finishing a book on the company that, hopefully, will be published in 2021.


9. The exchange rate, at the time, was approximately 1:5.

10. Actually, it was quite a bit. A Swiss laborer made $200–$250 per annum at the time. An ébauche maker earned about $100/month.

11. The majority of the 19th- and 20th-century complicated watches, bearing names of British watchmakers, originated in Switzerland.
12. Nicole’s 1844 patent also had three other inventions: a winding mechanism, a constant force escapement, and a banking arrangement.


14. The seconds could be split but there was no return to zero. Some were based on a heart cam, some on vertical pen-nib couplings (bec de plume). In 1843, Winnerl claimed that the idea had occurred to him in 1838; see Bulletin de la Société d’Encouragement pour l’Industrie Nationale (Paris: 1843), 192–97. His claim is corroborated by the fact that he submitted a split-seconds example (without the return-to-zero function) for the 1839 Paris Universal Exposition. Breguet’s compteur exists from 1838 with pen-nib coupling.


20. F. J. Britten, Watch & Clock Makers’ Handbook, Dictionary, and Guide, revised by Richard Good (New York: Arco Publishing, 1978), 60. Britten’s original editions (e.g., 9th ed. [London/New York: 1896], 167) states, “A heart-shaped cam was used in chronographs to cause the chronograph hand to fly back to zero. First applied by Mr. A. Nicole in 1862 (Patent No. 1461).” In the first four editions of Britten’s work (up to 1881), Nicole’s 1862 design was described in detail but without mentioning its inventor, which is particularly curious because the drawing of a chronograph mechanism was taken from one of Nicole’s watches. In his Old Clocks and Watches & Their Makers (1st ed. [London: 1894]) Britten wrote, “The foundation of this mechanism [the chronograph] is the heart-shaped cam, patented by the late A. Nicole in 1862 (No. 1461).” The fact that the heart was also in Nicole’s 1844 patent was not mentioned. However, the 4th edition (1911), claimed: “[I]n 1844 he patented keyless work (No. 10,348); the patent included a chronograph with heart-shaped cam; in 1862 he patented an improved chronograph with castle ratchet (No. 1,461).”


23. Feuille d’Avis du district de la Vallee, October 22, 1896, page 6: “M. Adolphe Nicole, qui déjà en 1844 prenait un brevet pour une montre avec aiguille de secondes partant d’un point, s’arrêtant à volonté, et retournant à son point de départ. En 1862, il prenait un second brevet pour chronographe perfectionné ...”

24. His later watches were based on Winnerl’s system.

25. In modern chronographs it was only in 1933 when G.-Leon Breitling came up with such a device and applied for a Swiss patent (no. 172129), which was granted 15 months later on February 28, 1935. Today, almost all chronographs are like that.


27. The firm of Nicole, Nielsen & Co. was the successor of Nicole & Capt.


29. Rieuxsec invented the inking chronograph in 1821 and kept improving it until, at least, 1837. He accused Breguet of passing his invention to Fatton. This controversy might be one of my next subjects for this Fact or Fiction column.

30. Some might argue that in races with multiple competitors, such as horse racing, inking chronographs were better because they were able to time all of the horses.

32. “Description de plusieurs compteurs de secondes, par M. Winnerl, horloger, à Paris,” Bulletin de la Société d’Encouragement pour l’Industrie Nationale (Paris: 1843), 192–97; not signed but most likely by Baron Seguier. There is an irony in that the French had all the ingredients for a chronograph ready in 1843, but it took 19 years and a Swiss-Brit to put them together in an easy and reliable mechanism.

33. There are other known chronograph patents based on a similar vertical clutch idea, with the possibility of slippage, but they are not practical at all (e.g., E. D. Johnson’s patent of November 30, 1855).

34. Formerly in the Tom McIntire Collection.

35. F. J. Britten, Old Clocks and Watches & Their Makers (Woodbridge, UK: 1911), 480.


37. He also patented it in France in the same year. Two years later he exhibited it there. Paris Universal Exposition of 1855: “322. Nicole (Ad.) à Londres, A. Modèle de machine à vapeur rotative” (under no. 128).

38. Some horological historians point to James Gowland’s watch at the 1851 Exposition as an exception, due to it being described with “winding and setting the hands through the pendant.” It might have been Nicole’s, but claiming that it must have been made by him is presumptuous. Gowland retailed many Swiss watches. From that period, I know of his No. 1690, which is stem wind and very Swiss.

39. Vaudrey Mercer, The Life and Letters of Edward John Dent and His Successors (London: Antiquarian Horological Society, 1977), 276: “Dent had acquired the right of the Patent from Nicole, becoming, as stated in a pamphlet produced by E. Dent & Co in 1879, the ‘Sole Licensee of their manufacture.’” Mercer also claims that the rights were acquired before 1846. No documents seem to exist to confirm that date.

40. Baron Seguier, Xᵉ Jury, 1ʳᵉ subdivision, Horlogerie (Paris: 1851), 51: “M[onsieur] Nicole, dans la maison Dent …”

41. Censuses for 1841 and 1851 list, respectively, four and six workers in Nicole & Capt’s employ. Information courtesy of Tony Maragna.


43. “Nous ne pouvons toutefois contester à M. H.-F. Piguet, d’avoir travaillé sur les chronographies pendant son séjour à Londres, dans la maison Nicole & Capt, de 1859 à 1861,” in Feuille d’avis du district de la Vallee (October 22, 1896), 6. Capt & Meylan was the Swiss successor to Nicole & Capt.

44. There are many chronographies without a castle wheel that are manufactured even today.

45. French patent no. 63035 of May 12, 1864. See also note 26.

**About the Author**

Philip Poniz is a mathematician turned horological historian, collector, author, certified master watchmaker, and restorer. At seven years old, he took apart his first watch, sparking his passion for complicated mechanisms, including automata. Many of the world’s ultra-complicated watches have passed through his restoration and forensic studio. His interests began with Renaissance clocks and watches, and he was very fortunate to examine and restore hundreds of them. Since then, he has embraced all complicated timepieces. His work ranges from being a court expert to a custodian of one of the largest horological e-libraries with over 8 million files. He was the chief expert at Antiquorum during its glory years, a position he later continued at Patrizzi & Co. He worked for Sotheby’s and Christie’s, wrote numerous articles, and lectured in Europe, Asia, and the United States. He is the manager of WatchInvest and the owner of European Watch & Casemakers. He moderates the NAWCC Complicated Watches Forum and has helped form several major horological collections. He is considered a leading expert on Patek Philippe, Breguet, and Cartier timepieces and their histories, as well as an expert in watch fakes and forensic horology, which led to his interest in starting this column.