THE OMEGA WATCHES "MARINE" AND "MARINE STANDARD"

TWO UNUSUAL WATERPROOF WATCHES FROM THE 1930S

By David Boettcher (ENG)

In 1932 Omega introduced the first diver's watch, the Omega Marine.

This statement may come as a bit of a shock to some people, who will think "Hang on a minute; I thought Rolex made the first waterproof watch." Well, yes: the waterproof Rolex Oyster was introduced first, in 1926, but Rolex did not claim that the Oyster was suitable for diving or submersion in water to any great depth. It probably never occurred to them because diving was a commercial or military activity in 1926 for which wristwatches were not required. The Oyster was certainly waterproof for ordinary swimming and was potentially capable of being the first diver's watch, but the Omega Marine was the first watch to be specifically tested and qualified for diving depths.

Figure 1. The Omega Marine.

After the success of the Marine, Omega introduced another rectangular waterproof watch in 1939. Rectangular watchcases are more difficult to make waterproof than round cases because there is no possibility of threading and screwing on the bezel and case back. The 1939 rectangular Omega watch used a novel system of gaskets and clips to make it waterproof. In homage to the Marine, and because it was included in the standard range, this watch was called the Omega Marine Standard.

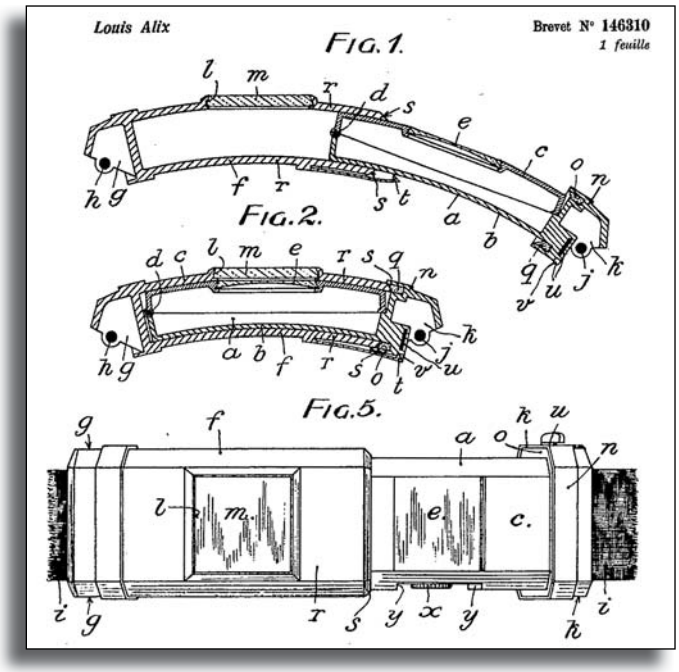


Figure 2. Louis Allix patent CH 146310.

Let's take a closer look at these two interesting watches.

THE 1932 OMEGA MARINE

Deep underwater diving began as a commercial or military activity, involving heavy suits and helmets, air pipes, and communication cords to the surface, with no need for the diver to wear a watch. By the mid-1920s some adventurers were starting to explore the undersea world, and the first experiments with aqualungs, or self-contained underwater breathing apparatus (Scuba), had been made by Yves Le Prieur in France. Whether the Omega Marine was introduced in response to the needs of these intrepid explorers, or whether it was pure serendipity of a design that met an arising need, history does not reveal.

At the time, Rolex had a monopoly on waterproof watch winding crowns and stems through the patented Rolex Oyster screw-down crown (see my article in the December 2010 *Watch and Clock Bulletin,* No. 389), so Omega needed a waterproof wristwatch design that would avoid the possibility of infringing the Rolex patents on the waterproof crown. This design came about in the form of Swiss patent CH 146310, granted to Louis Alix of Geneva on April 15, 1931. Alix's design overcame the problem of making the winding stem waterproof without infringing Rolex's patents by the simple expedient of sliding a complete watch inside a second outer casing and sealing the joint between the two casings with a gasket. Recognizing that the watch was uncompromisingly intended for use underwater, it was called the Omega Marine (Figure 1).

As shown in the figures from the patent (Figure 2) and the picture of the watch with the inner and outer cases separated (Figure 3), the movement, dial, and hands are housed in a rectangular-section interior case, labeled "a" in the patent, which also carries the winding crown. This interior case has a shoulder at the end with a groove con-

Figure 3. Omega Marine opened for winding.

taining a gasket, labeled "q" in the patent. The interior case slides into a rectangular-section outer case labeled "f" in the patent. When the interior case is slid fully home into the outer case, the end "s" of the outer case contacts the gasket "q" in the shoulder of the interior case, forming a watertight seal.

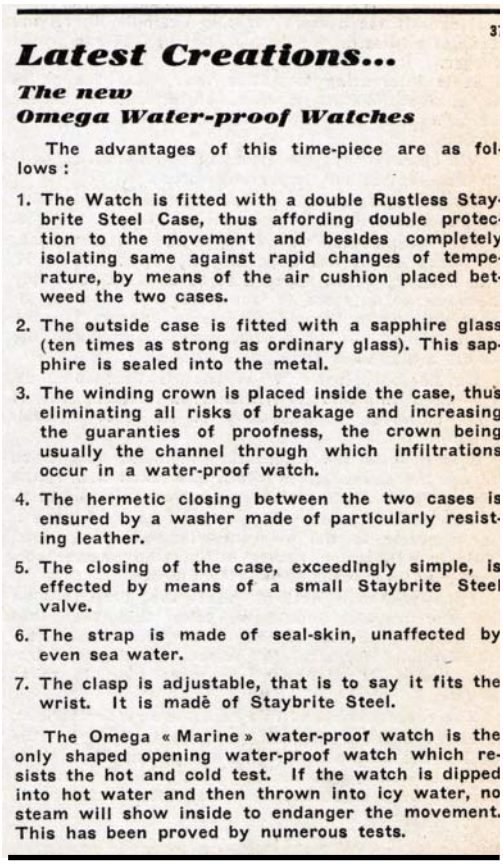
Louis Alix envisaged the two parts of the case being held together by the spring clip "t," which he described as being integral with the outer case "f." This clip provides the initial seal between the inner case, the gasket, and the outer case, but as the watch is submerged, the air pressure inside the case remains at atmospheric pressure while the water pressure outside increases, pressing the two parts of the case more firmly together onto the gasket and making the seal more watertight.

The spring clip described by Alix is not how the case clips were actually manufactured. There were two different generations of the Marine case; the first had a massive clasp on the back of the outer case, running right from the top to the bottom, as shown in Figure 4. A second generation of the Marine case, from about 1935 onward, had a much shorter clasp hinged close to the bottom edge of the case.

Figure 4. Securing clip.

The case of the Marine was a very fine high-quality construction, ensuring that the two parts slid together smoothly but tightly so that the waterproof seal could be achieved, even though the clasp only acted on one side of the case.

In his patent, Louis Alix suggests that the gasket "q" should be made of natural rubber ("caoutchouc"). However, in advertisements from the period (Figure 5) this gasket is said to be leather, which is confirmed in the book *OMEGA–A Journey through Time*.[1] The use of leather shows how difficult it was at the time to find a satisfactory gasket material—something we often forget today when



Latest Creations...

The new Omega Water-proof Watches

The advantages of this time-piece are as follows :

1. The Watch is fitted with a double Rustless Staybrite Steel Case, thus affording double protection to the movement and besides completely isolating same against rapid changes of temperature, by means of the air cushion placed between the two cases.
2. The outside case is fitted with a sapphire glass (ten times as strong as ordinary glass). This sapphire is sealed into the metal.
3. The winding crown is placed inside the case, thus eliminating all risks of breakage and increasing the guaranties of proofness, the crown being usually the channel through which infiltrations occur in a water-proof watch.
4. The hermetic closing between the two cases is ensured by a washer made of particularly resisting leather.
5. The closing of the case, exceedingly simple, is effected by means of a small Staybrite Steel valve.
6. The strap is made of seal-skin, unaffected by even sea water.
7. The clasp is adjustable, that is to say it fits the wrist. It is made of Staybrite Steel.

The Omega « Marine » water-proof watch is the only shaped opening water-proof watch which resists the hot and cold test. If the watch is dipped into hot water and then thrown into icy water, no steam will show inside to endanger the movement. This has been proved by numerous tests.

Figure 5. Marine announcement from a 1936 *Journal Suisse Del'Horlogerie*.

so many high-performance synthetic gasket materials are available.

Louis Alix's design for the case, shown in Figure 2, called for the case to have the curved shape of an arc of a circle. He doesn't explain why: it may have been to follow the shape of the wrist, or it may have been a purely aesthetic consideration—this was the age of art deco after all. I don't think this curved shape was actually ever produced. All the pictures of Omega Marines that I have seen (I have never been lucky enough to actually handle one) have been straight. The elegant curved shape envisaged by Alix would have been extremely difficult to manufacture.

The patent illustrates a slim crown recessed into a depression on the side of the interior case. This was not very practical and would have been very difficult to grasp to wind the watch. Production models generally had the crown at the top of the movement, at the 12 o'clock position like a pocket watch. This can be seen in Figure 3. However, I have also seen advertisements and pictures of watches with the case effectively the

The pictures of the Omega Marine were supplied by Frank Bird who relates the following family history of his watch: Regarding the history of this particular watch, my father told me that he had purchased it new in 1948 at a local jewelry store in Vancouver, BC. The store must have had it in their inventory unsold for quite some time, as the serial number of the watch, 9392828, from my research, indicates an Omega manufacturing date of 1939 or 1940. I recently discovered, in a box of old family papers, a time payment booklet from Shores Credit Jewellers of Vancouver, which confirms my father's purchase of the watch for $156 on February 14th, 1948.

My father could certainly not have been considered wealthy, so his reason for the purchase of an Omega Marine remains a bit of a mystery, although he was aware, at the time, of the rarity and unique properties of the watch. He was not a diver; his only association with water was the fact that during wartime he was employed helping to build warships in the local dockyards.

I never knew about the watch until my father presented it to me a few years before he passed away. He did mention to me once that the jewelry store offered an attractive purchase discount on the watch and that the same jeweler, some years later, offered to buy it back, but my father declined the offer. The jewelry store went out of business in the early 1970s.

At some point my father had the original leather or sealskin strap changed for the current bracelet, a steel mesh "Forstner Komfit." Still missing is the presentation case for the watch. I often wonder if the original leather bracelet is to be found in the missing case!

The watch appears to be in fine condition in all respects. My father wore it for only a short period of time and then for reasons unknown, stored it unused for nearly 60 years. I have had the watch serviced by a local Omega expert and it keeps excellent time.

"other way up" and opening from the top rather than the bottom. The crown is then at the 6 o'clock position.

The patent for the Marine was also granted to Alix in France as 710316, Britain as 365356, U.S. as 1907700 and Germany as 567213, and a list of all the patents was stamped in the back of the outer case of the watch as shown in Figure 6. The picture I have used in Figure 6 is actually of a Marine Standard, discussed later, but the list is the same. The French patent reference is always shown with the letters "S.G.D.G," which stand for Sans Garantie du Gouvernement [Without Government Guarantee], the French Government evidently being happy to grant exclusive rights to an inventor in exchange for a fee, but also being careful not to imply any guarantee that the thing would actually work!

Figure 6. List of patents.

In advertisements at the time, Omega identified seven advantageous features for the Marine, as can be seen in the advertisement reproduced in Figure 5.

The case was made from "Staybrite" steel, the trade name given to the first commercial stainless steel in 1924 by the steelmakers Thomas Firth & Sons (later Firth Brown) of Sheffield, England, where it had been invented in 1913 by their metallurgist Harry Brearley. In addition to being watertight, the air jacket between the two cases protected the movement against changes in external temperature, rather like the insulating layer of air in double glazing.

The outer case had a sapphire "glass" in the front so that the dial of the watch could be seen. This was the first use of artificial sapphire for a watch crystal, and it was chosen because it was much stronger than glass—ten times as strong according to the advertisement—and therefore better able to resist water pressure at diving depths without flexing or cracking. It is also one of the hardest substances on earth, surpassed only by diamond, and much more scratch resistant than a glass or plastic crystal, which is an advantage if the watch is subjected to rough treatment. Artificial rubies had been used for watch jewels since the technique for growing them was invented in the nineteenth century, and sapphire is the same basic compound of aluminum oxide as ruby, but with different trace elements that cause the colors of the two gems. Synthetic sapphire is made without coloring elements, and because it is so hard, it is very expensive to shape and polish. This use of sapphire would have added considerably to the cost of making the watch, which would already be expensive due to the precision two-part case.

In an apparent veiled swipe at the Rolex screw-down waterproof crown (which was of course located on the outside of the case) the protection afforded through locating the crown inside the outer case was emphasized.

The advertisement states that the hermetic seal between the two cases is ensured by a washer, made of a "particularly resisting leather" as already discussed above. The case is said to be closed by a "small Staybrite steel valve" where "valve" must be a mistranslation for the folding clasp that holds the two cases together.

The watch strap was made of sealskin, which was said to be unaffected by even seawater. The clasp (Figure 7), again made of Staybrite steel, is itself an interesting and unusual design. It was a type of folding deployant clasp with a ratchet for rapid adjustment to suit different sizes of wrist, or to allow it to be quickly adjusted to fit over a diving suit. Many of these clasps seem to have been lost, probably when the original strap was replaced, and to see a watch today with its original clasp is very rare.

Figure 7. Advertisement showing original clasp.

TESTING THE MARINE

The Omega Marine was subjected to unprecedented testing (Figure 8). In 1936 two complete watches and one empty case were immersed in water at a temperature of 85° Celsius for several minutes, and then sunk to a depth of approximately 70 meters (220 feet) at a temperature of 5° Celsius in Lake Geneva for 30 minutes. In another test, several watches were immersed in water at a temperature of 87° Celsius for a few minutes and then plunged into water at a temperature of 5° Celsius to test their resistance to extreme temperature variations. In both tests no water entered any of the cases, and the watches continued to work perfectly.

Technical improvements

(Reported by the Manufacturers.)

In a preceding number, we had the pleasure of our presenting to our readers Omega's new « Marine » waterproof watch. We are pleased to be able to reproduce herewith the description of two tests to which this watch was submitted, proving that the Omega factory has neglected nothing in order to give its waterproof watch a real practical value. These tests certainly go beyond the limits to which such a watch will be normally subjected by the greater part of the public. Here is an extract of the report furnished by Mr. Léon Graber, Notary Public in Geneva, dated June 29th, 1936, handed to us by the Omega Factory.

FIRST EXPERIENCE : 2 waterproof OMEGA gold watches, 1 waterproof OMEGA Staybrite Steel case were left during 3 to 4 minutes in water at the temperature of 85° C (185° Fahrenheit) and then kept during 30 minutes at 220 feet below the surface of the Lake of Geneva, the pressure being of approximately 7 atmospheres and the temperature of 5° C (41° Fahrenheit).

Result : The 2 OMEGA waterproof watches and the OMEGA Staybrite waterproof case were in perfect condition and did not contain the slightest trace of water. The two complete OMEGA watches were working perfectly.

SECOND EXPERIENCE : The 5 watches and the case in question were again placed under water at the temperature of 87° C (188° Fahrenheit) and immediately after under water at 5° C (41° Fahrenheit).

The result was exactly the same as during the first test.

Moreover, here is the opinion expressed by Dr. Beebe, the famous undersea explorer, concerning the Omega « Marine » Watch:

« To give the OMEGA water watch « Marine » its most difficult « test, I have taken it down 7 fathoms to the floor of the Pacific « Ocean — pressure 7 fathoms deep is twice greater than normal — « and have found it highly dependable and trustworthy under these « unusual circumstances.

« Its resistance to water and dust and its sturdiness seem to me « distinct advances in the science of watch manufacture.

Signed : William Beebe. »

June 23th., 1936.

The ancestor of our aqualung diving apparatus was Le Prieur's 1933 compressed-air cylinder.

Figure 8, left. Testing the Marine Omega.

Figure 9, above. Commander Yves Le Prieur. Also see back cover.

In May 1937 the Swiss Laboratory for Horology in Neuchâtel certified the Omega Marine as being able to withstand a pressure of 13.5 atmospheres, equivalent to a depth of water of 135 meters (445 feet). This was the first official certification of water pressure resistance of any watch, and it made the Omega Marine the first tested and certified diver's watch.

PIONEER USERS

The Omega Marine was worn and endorsed by Dr. William Beebe, the American naturalist and explorer who took up underwater exploration in the late 1920s, and was also worn by Commander Yves Le Prieur, a French Naval Officer, inventor, and pioneer of self-contained underwater breathing apparatus (Scuba).

Dr. Beebe is probably most famous for his 1934 descent in the "Bathysphere" to a depth of 3,028 feet beneath the ocean surface. But Beebe was also a pioneer of underwater natural history with helmet diving from 1925. In 1936 he made a helmet dive in the Pacific wearing an Omega Marine. Afterward he wrote "To give the Omega water watch "Marine" its most difficult test, I have taken it down 7 fathoms to the floor of the Pacific Ocean—pressure 7 fathoms deep is twice greater than normal—and have found it highly dependable and trustworthy under these unusual circumstances. Its resistance to water and dust and its sturdiness seem to be distinct advances in the science of watch manufacture."

Commander Yves Le Prieur of the French Navy invented in 1925 a self-contained underwater breathing apparatus or aqualung, which for the first time allowed a diver to swim free without any connection to the surface. In the 1957 book *The Silent World,*[2] by Captain Jacques-Yves Cousteau and Frédéric Dumas, there is a picture of Le Prieur diving with his aqualung and his 1933 invention of the full face mask. He is wearing an Omega Marine on his left wrist. See Figure 9, complete with Cousteau's caption acknowledging the derivation of his aqualung apparatus from Le Prieur's inventions.

Le Prieur was a fascinating character and prolific inventor. As a naval officer he served in Asia and used traditional deep sea diving equipment. He learned Japanese, was military attaché at the French Embassy in Tokyo, became the first person to take off in a plane from Japanese soil in 1909, and won a black belt in judo. Returning to Europe he invented a rocket to bring down enemy observation balloons. He witnessed a demonstration of Fernez lightweight underwater breathing apparatus in 1925, and immediately had the idea of replacing the long tube carrying air from the surface with a cylinder of compressed air. Fernez and Le Prieur demonstrated the self-contained apparatus, with a pressure regulator designed by Le Prieur, publicly in 1926, and it was adopted by the French Navy. Le Prieur invented an improved version of his apparatus in 1933 with a full face mask. It was this apparatus that Cousteau improved with a demand control valve and made famous. In 1935 Le Prieur and filmmaker Jean Painlevé opened the first diving club, Club des Sous l'Eau, in Paris.[3]

EVERYDAY PRACTICALITIES

The Omega Marine was not a self-winding automatic, so it had to be manually wound every day. To wind the watch or set the hands obviously meant removing the inner case from the outer, which was a bit of a nuisance. It would also have been an expensive watch to make, with its precision-made double case, and hence expensive to buy. This cost, together with the inconvenience of its design in daily use, should have restricted its popularity to those who really needed a fully waterproof watch.

The basic Omega Marine with stainless steel case had the Omega factory reference number CK 679. However, in *Omega–A Journey Through Time*, numerous examples of the Marine are illustrated in mixtures of steel and gold, as well as 18-carat gold versions retailed by Tiffany and Cartier in New York. The case design naturally lent itself to the art deco style in vogue at the time, and Marines were produced with art deco-style dials, case bands, and strap lugs. Obviously, these precious metal cases and art deco design features weren't necessary in a diver's watch and are in stark contrast to the strictly functional steel cases and easy-to-read dials of today's diver's watches. It would seem that, just as today, watches with unusual technical features attracted the attention of those who like something different, perhaps because they like gadgets or want to impress their friends, and the Omega Marine must have sold to many people who wouldn't dream of diving deeper than their local swimming pool.

THE MOVEMENTS

The Marine was at first fitted with the manual winding calibre 19.4 T1, created in 1930, then later with the improved 19.4 T2, created in 1935 and still a manual winding movement. Omega was rather unusual at the time in referring to their calibers in millimeter rather than ligne sizes, and 19.4 means these movements were 19.4 mm diameter. They were round movements, not shaped to the form of the watchcase. The 19.4 T1 and T2 calibers were available with either 15 or 17 jewels and operated at 18,000 vibrations per hour. Although the Marine would have been an ideal candidate for an automatic winding movement, Omega did not introduce their first automatic movements until 1943, with the bumper automatic 28.10 and 30.10 calibers, and the Marine was never fitted with an automatic movement.

OMEGA MUSEUM COLLECTION

In 2007 Omega added a reproduction of this watch, the "Marine 1932," to its Museum Collection limited series of reproduction vintage timepieces. The double case was made in contrasting 18-carat red and white gold, and the series was limited to 135 pieces to commemorate the 1937 official certification of the watch's water resistance to a depth of 135 meters. There are some nice pictures of this watch on Omega's website at http://www.omegawatches.com/press/press-kit-text/833.

OMEGA AND TISSOT

Paul-Emile Brandt, grandson of the founder of Omega Louis Brandt, began the process of bringing Omega and Tissot together in 1925 in response to the severe economic downturn at the time. In 1930 Paul Tissot-Daguette, great-grandson of the founder of Tissot, Charles Félicien Tissot-Daguette, became managing director of Omega, as well as managing director of Tissot. The two companies came together as subsidiaries of a new multinational holding organization, Société Suisse pour l'Industrie Horlogére (SSIH) to produce a complete range of watches, and for joint sales promotions.

They maintained separate factories and made similar but slightly different movements. It seems that both factories made movements for both brands, with the Tissot factory in the main concentrating on simpler movements, and the Omega factory on more complicated movements. However, production was sometimes transferred from one factory to the other to optimize the use of production facilities. Where a movement was used in both a Tissot and an Omega watch some differences were introduced to prevent watchmakers swapping movements between watches of different brands. Usually the sizes of the movements were slightly different, but because Tissot tended to be a medium-price brand, some details were made cheaper. For instance, an Omega caliber movement has a Breguet overcoil balance spring, while the Tissot counterpart has a flat balance spring.

The watch in Figure 10 is a version of the Marine produced by Tissot. It is branded "Omega Watch Co. Tissot" in the case back and on the movement, and has in the case back the same list of the patents granted to Alix as in the Omega version. The movement in the watch pictured is a Tissot caliber 19.4, which is the same size as the Omega caliber 19.4 but is quite different in layout.

In *Omega–A Journey through Time* Marco Richon says that in 1935 an economic collapse in Brazil made it impossible for Omega to maintain sales at Omega's normal price points. Rather than cut prices just for Brazil, the company withdrew marketing and sales from the coun-

Figure 10. Tissot Marine.

try. To keep the Omega name alive they branded watches sold in Brazil at lower price points "Omega Watch Co. Tissot," so this watch may have been originally sold in Brazil, or Omega may have used the same practice in other markets suffering economic difficulties.

LOUIS ALIX

So who was Louis Alix, the designer of the Omega Marine waterproof case? There seems to be very little known about him. He is recorded in his patents as "Louis Alix of 1 Rue du Commerce, Geneva, Switzerland, a citizen of the French Republic." The patent for the Omega Marine, and his other patents, were taken out in his own name, so he was not an employee of Omega or any other firm, because then the patent application would be in the name of the firm, not the individual.

The registration announcement for the Marine case patent CH 146310 shown in Figure 11 appeared in the May 30, 1931, edition of the trade journal *La Fédération Horlogère Suisse*. It records Alix's occupation as *sertisseur-joaillier* [jewel setter]. This refers to setting jewels in jewelry, not for watch bearings, and shows that Alix was a jeweler rather than a watchmaker.

Cl. 71 f, No. 146310. 10 mars 1930, 20 h. — Boîtier étanche de montre-bracelet. — *Louis Alix*, sertisseur-joaillier, 1, rue du Commerce, Genève (Suisse). Mandataires: Imer et de Wurstemberger ci-devant: E. Imer-Schneider, ingénieur-conseil, Genève.

Figure 11. Patent registration announcement.

I have found four Swiss patents granted to Louis Alix between 1930 and 1941. The first one is patent CH 146310, with a priority/registration date of March 10, 1930, and a publication/grant date of April 15, 1931.

Alix's second patent, number CH 160827, was published on March 31, 1933. It was for a spring-loaded *bouton de manchette* [cufflink]. I find it difficult to conceive of a watchmaker being interested in designing improved cufflinks, so in my mind this confirms that he was a jeweler rather than a watchmaker.

His third patent, number CH 204295, *Remontoir de montre étanche* [Crown for a waterproof watch] published April 30, 1939, returns to watchmaking. It is a design of a screw-down crown for a waterproof watch that appears intended to circumvent the Rolex Oyster screw-down crown patent. It is absurdly complicated and inelegant, and I am confident just from looking at it that it was never actually used.

The fourth patent, number CH 223807, published October 15, 1942, was titled *Procédé de fabrication de montres et montre obtenue suivant ce procédé* [Method of manufacturing watches and watches produced by this method]. This patent was for making watchcases, or parts of watchcases, from aluminum, because of its corrosion resistance and ability to be colored by anodizing. The claims are extremely general in nature and I am surprised that a patent was granted just on the idea that aluminum could be used to make a watchcase. However, because aluminum watchcases are very thin on the ground, I would even say almost nonexistent, I think it is safe to say that this patent was also not a great success.

So Louis Alix was a jewel setter in the jewelry rather than the watch trade and an amateur inventor. The curved shape he proposed for the watchcase would have been very difficult and expensive to make, indicating that he was not engaged in watchcase manufacturing, or he would naturally have designed something more practical.

Alix must have hit it lucky with the design of the Omega Marine case at just the time Omega was on the lookout for a waterproof case to catch up with, or even get ahead of, Rolex. The idea for the Marine case was not even all that original, because cases with the whole watch contained inside a waterproof outer case had been granted to Jean Finger and Frederick Gruen in the 1920s (see my letter in the April 2011 *Watch and Clock Bulletin*, No. 391). A number of manufacturers, including Eberhard, Zenith, and many others, made hermetic watches using the Jean Finger patent; Rolex produced one called the Rolex Hermetic. But Alix secured his patent because his rectangular sliding case was novel, Omega spotted it and snapped up the rights, and the rest, as they say, is history.

WHO MANUFACTURED THE CASE FOR THE OMEGA MARINE?

The maker of the case for the Omega Marine was Frédéric Baumgartner, a Geneva-based casemaker. Although Baumgartner's name doesn't appear on any of the cases, the firm's "Collective Responsibility Mark" can be seen in gold Omega Marine cases.

In the 1920s, members of the Swiss union of gold watch casemakers, the *Fédération Suisse des Associations de Fabricants de Boîtes de Montres Or (F.B.),* started marking cases made of precious metal (gold or platinum) with a stamp, or *Poinçon de Maître* [literally "Punch of the Master" but usually translated as "Responsibility Mark"] consisting of a symbol, called a collective responsibility mark, and a unique number assigned to each maker by the Union. The responsibility mark shown in Figure 12 consists of a small Geneva key with the number 2 on the lever. The same mark can be seen in the cases of gold Omega Marines, but it is very difficult to photograph because the bezel obscures it, which is why I have used this illustration.

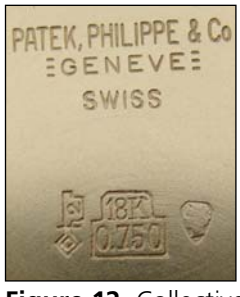


Figure 12. Collective Responsibility Mark.

This collective responsibility mark, the Geneva key and number 2, was registered to F. Baumgartner SA of Geneva. Entries in *La Classification Horlogere Suisse*[4] con-

firm that F. Baumgartner SA of Geneva, casemaker, was Frédéric Baumgartner, a Geneva watch casemaker. I will talk a lot more about Baumgartner in the next section on the Omega Marine Standard, but the case for the Omega Marine was his firm's first waterproof case.

How did Alix and Baumgartner meet? I haven't been able to find any evidence, such as a commercial agreement, but it seems likely that Alix developed his design and applied for the patent, and then approached Baumgartner to see if he would manufacture it. The "priority date" for the patent, the date on which Alix deposited the application at the patent office, was March 10, 1930, well before the Omega Marine was introduced in 1932.

As the map of the center of Geneva (Figure 13) shows, Alix's and Baumgartner's premises were only a stone's throw from each other, with Alix at 1 Rue du Commerce ("A" on the map) and Baumgartner at 13 Rue de la Coulouvrenière ("B" on the map). The distance between them was 750 meters, which would take about 10 minutes to walk, so if Alix decided to go knocking on watchcase manufacturers' doors, Baumgartner's would be one of the first, if not THE first, door that he would come to. As well as watchcases, Baumgartner also manufactured jewelry, so they were in the same trade, and it is most likely that Alix would have known about Baumgartner making watchcases.

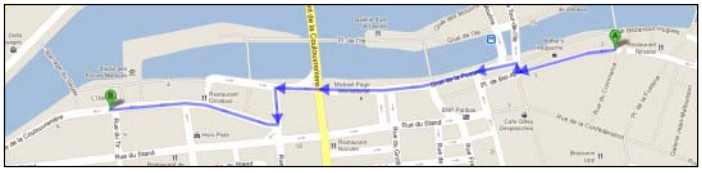


Figure 13. Path from Alix's to Baumgartner's offices in Geneva.

THE 1939 OMEGA MARINE STANDARD

In 1939 Omega introduced into their standard range a rectangular waterproof watch. This watch had a simpler case than the 1932 Omega Marine, which would have been cheaper to make. It also had the crown on the outside of the case, so that it was easy to wind every day and set the hands to the correct time. In homage to the 1932 Marine, and in recognition that this watch was part of the standard range, it was called the Marine Standard (Figure 14).

The Omega reference number for the basic model of this watch was 3635, and it contained an Omega caliber T 17 movement. Fitted with a sapphire crystal, it was called the "Deluxe Marine," reference 3637. A smaller ladies' version was also made, reference 3673. Omega reference numbers are preceded by a key to the case material, such as CK for steel and OJ for yellow gold [Or Jaune], so an OJ 3637 is a Deluxe Marine with a yellow-gold case.

Figure 14. Omega Marine Standard.

THE RECTANGULAR CASE

It was the waterproof rectangular case that really made the Omega Marine Standard unusual as a watch, different from the many other rectangular watches that the art deco style had made so fashionable in the 1930s, and which usually had poor case sealing due to the rectangular shape. The case of the Omega Marine Standard was designed and made by Frédéric Baumgartner.

Waterproofing was achieved by rubber gaskets for the crystal and in the case back, which sealed the joint between the case back and the middle part of the case containing the movement. The case back was held in place by two very distinctive clips.

Frédéric Baumgartner obtained three patents on the design of this case. The first, CH 215449, was registered on August 28, 1940, and concerned a method of sealing the joint between the crystal and the case. The second patent, CH 216460, was also registered on August 28, 1940, and concerned the design of the clip back case.

The third patent, CH 220263, was registered on June 30, 1941, and reflected an improved design of the clip back case and a different method of sealing the crystal. Let's take a look at these patents in detail.

FIRST-GENERATION MARINE STANDARD: THE 1940 PATENTS

The first 1940 patent, CH 215449 (Figure 15), shows the joint between the crystal and the case sealed by a rubber gasket. The crystal and gasket are fitted from inside the case before the movement goes in. The figure shows how a rectangular plastic crystal **3** was molded with an annular groove **4** with a lower shoulder **5** and an upper shoulder **6**. A sealing ring or gasket **7** rests on the shoulder **5**. The bezel presents an annular projection **8,** which enters the groove **4** of the crystal, and the upper edge of the groove **4** in the crystal engages over the shoulder **6** of the bezel, while the lower shoulder **5** of the crystal presses the sealing ring against the bezel.

For mounting, the crystal and the gasket are simply pushed into the bezel. I have added a small exploded view to Figure 15 that shows the crystal and gasket being inserted into the bezel in the direction of the arrow. The tapered shoulder of the crystal slides into the bezel, compressing the plastic until the upper shoulder of the crystal clears the rim of the bezel, which snaps into the groove in the crystal. This holds the crystal and gasket in

place firmly. I doubt that hand pressure alone could have exerted sufficient force to insert the crystal and achieve sufficient clamping force on the gasket to ensure a seal, so I imagine that a press would have been used. Most watchmakers wouldn't have a press to replace a broken crystal, so a trip back to the factory or main dealer would be necessary—a drawback to this design.

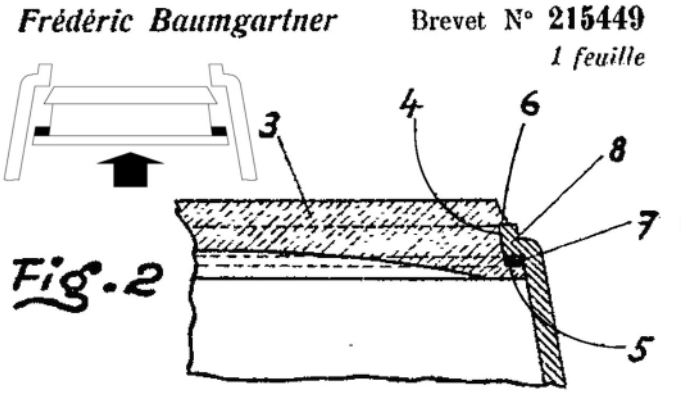


Figure 15. Patent CH 215449.

The second 1940 patent, CH 216460 (Figure 16), gives more details of the design of the case. The details of mounting the crystal are the same as patent CH 215449, but the patent now also shows an inner case **8** that includes the bezel. This case is open at the back and is enclosed in an outer case **7** that carries two large hinged clips **10**. The case back **1** is separate and has a groove around its outer edge that carries a gasket **13**. When the case is assembled, the two clips on the outer case hold the case back against the inner case, and a seal is made between the inner case and the gasket in the case back.

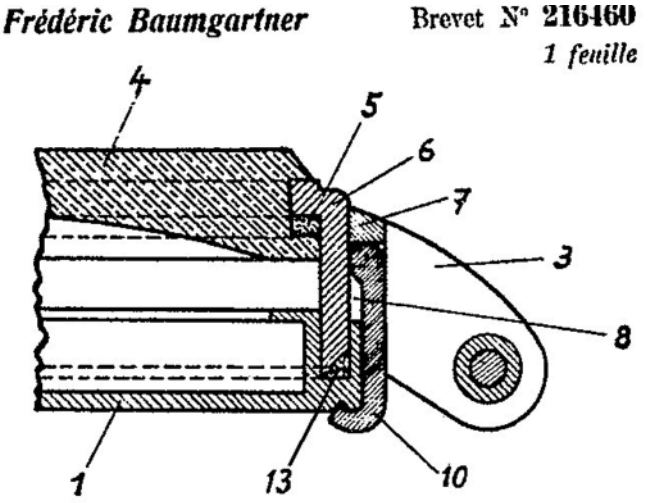


Figure 16. Patent CH 216460.

Figure 17 shows a Marine Standard case separated into its three parts: the outer case on the left with the two large spring clips; the inner case carrying the movement, winding crown and stem, dial and hands, and the crystal; and the case back with the gasket in its groove clearly visible.

To assemble the watch, first the crystal and gasket were clipped into the inner case. Then the movement and dial were inserted into the inner case, and the crown and winding stem were inserted into the movement through the case wall and fixed in place.

The inner case was then placed inside the outer case, the tube for the winding stem fitting into the slot cut in the outer case just visible to the left of the picture. The case back with the gasket in place would then be offered up, the groove containing the gasket located on the rim of the inner case. Finally, the two large clips were sprung into place in grooves in the case back, holding the case back and gasket firmly against the inner case, and holding the inner case inside the outer case.

SECOND-GENERATION MARINE STANDARD

Although the design of the Marine Standard meant that increasing water pressure would press the case back harder onto the case back gasket, increasing the seal, it would have the opposite effect on the crystal, pressing it into the case and reducing the pressure on its gasket, thus weakening the seal. The seal between the crystal and the inner case was hence the weakest part of the design and limited water pressure resistance to 2 atmospheres (10 meters, 33 feet). This weakness was remedied by a second-generation design patented in 1941 shown in Figure 18. In this design, the case back sealing arrangement is unchanged, but now the crystal **3** is inserted into the bezel **2** from outside and

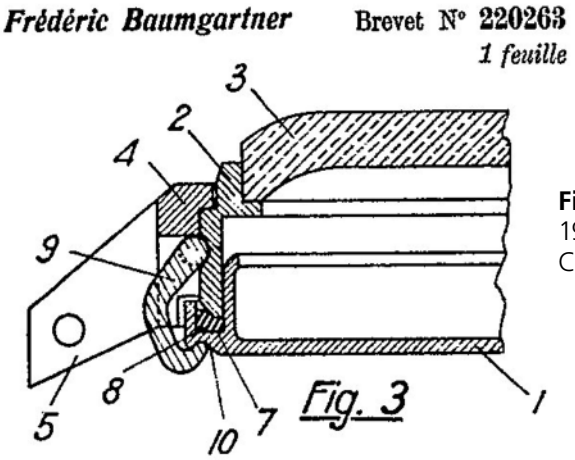


Figure 18. 1941 patent CH 220263.

Figure 17. Marine Standard case parts.

sealed with waterproof cement. The Omega reference number for this second-generation case was 3683.

The clips holding the back of a Marine Standard in place are very distinctive (Figure 19), enabling recognition of this case design from just a view of the back of the case. Although the outer case and inner case look as though they were forged, they must have been very precisely made or machined, because the clips shown in the 1940 patent are very straight and the whole assembly must be held tightly together by just the small amount of elasticity or "spring" available from the case back gasket. Perhaps this was also found to be a problem, because the clips shown in the 1941 patent are bent, and would have contributed some of their own spring to holding the assembly together.

Figure 19. Marine Standard case back clips.

CROWN / STEM SEAL

The Omega Marine Standard has its crown on the outside of the case, and therefore the opening in the side of the case that the winding stem passes through must be sealed. This detail is not covered by any of the Baumgartner patents, but was achieved by gaskets or "o" rings in the stem tube or in the crown, or possibly both.

THE OMEGA T17 MOVEMENT

Designed in 1934 by Charles Perregaux under the direction of Henri Gerber, the T17 was a shaped, rather than round, movement, T meaning Tonneau or barrel shaped. It incorporated a large going barrel containing an unusually powerful mainspring. With increased gearing compared to other movements, the T17 had a 60-hour power reserve; rather astonishingly, this remained the longest power reserve of all mechanical wristwatch movements made by Omega until the caliber 8500 of 2006. If wound every 24 hours, as was normal, the use of only part of the mainspring's capability delivered more constant torque to the gear train compared to a normal mainspring, which wound down fully in a shorter time, and contributed to the outstanding accuracy of a movement, which was just 17 mm across and 24.5 mm long. More than 167,000 of these movements were produced up to 1943.

TISSOT MARINE STANDARD

Baumgartner also supplied these cases to Tissot for a Tissot version of the Omega Marine Standard, at least some of which were called "Aquasport." The cases of these Tissot versions of the Marine Standard that I have examined are obviously an evolutionary development of the Omega Marine Standard design.

I have one of these Tissot versions of the Marine Standard. There is no separate loose inner case carrying the crystal. There is instead what looks like a friction-fit inner case that traps the crystal and a gasket between it and the outer case. I have drawn a sketch of what I think is the arrangement (Figure 20), but I was not able to remove the inner case from the outer case. I think these inner cases may have been press fitted together at the factory, in which case a damaged crystal would probably need a trip back to the factory to be replaced.

This appears to be another generation of the Baumgartner clip back case that was not patented. One of the benefits of this modification is that the clamping force of the clips on the back compresses the crystal gasket as well as the case back gasket, which is an improvement over the design of the first generation of the Omega Marine Standard.

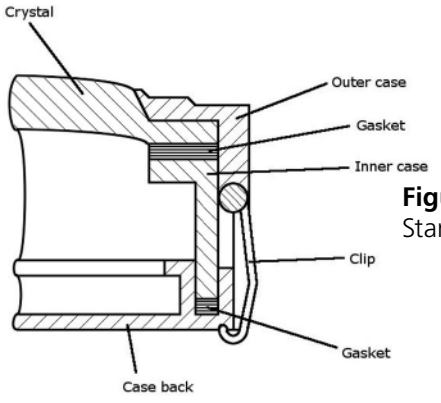


Figure 20. Tissot Marine Standard cross section.

OTHER MANUFACTURERS

In addition to Omega and Tissot, Baumgartner also supplied these clip back cases to Jaeger LeCoultre, Movado, Longines, and possibly others. Watches in these cases are also seen marked Bravingtons, a renowned jeweler in Kings Cross, London, who retailed Swiss-made watches under their own name.

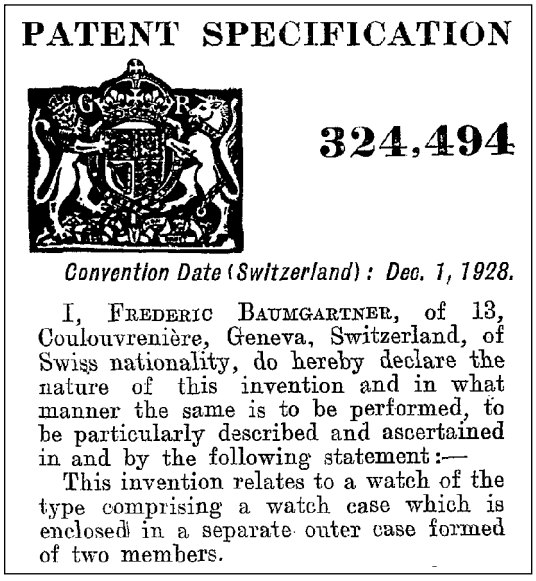
LISTS OF PATENTS

In the case back of these Baumgartner clip back cases there is usually a list of the Louis Alix patents for the design of the 1932 Omega Marine. One of these case backs from an Omega Marine Standard is pictured in Figure 5 above, in the section on the Omega Marine. The reason for listing the Alix Marine case patents rather than those specific to the Marine Standard case may have been because Baumgartner was a bit slow in getting his patents registered in 1940 and 1941, some time after the Marine Standard was actually introduced in 1939, and the Louis Alix patent numbers were stamped into the cases to provide some vague warning that the design was patented before the later patents were granted. I can't think of any other reason, because the two designs are totally different. However, this does reinforce the view that Baumgartner had purchased the rights to the patents from Louis Alix and could therefore refer to them as he saw fit.

FRÉDÉRIC BAUMGARTNER

So who was Frédéric Baumgartner, and did he or his firm have a background in waterproof watchcases? This is difficult to research because there is nothing in the usual sources of information on watchmakers, such as Jaquet & Chapuis or Pritchard, which hardly mention watch casemakers at all. However, I did manage to discover a little of the history of the firm.

I found eight Swiss patents granted to Frédéric Baumgartner, beginning in 1928 with a Swiss patent CH 135793 for a protective case for a pocket watch (see list below). This is a case to protect a watch against knocks by other items being carried in the same pocket or purse and is not intended to be waterproof. A U.K. version of this patent, GB 324494 shown in Figure 21, gives Frédéric Baumgartner's address as 13 Coulouvrenière, Geneva, which ties in with the advertisement shown in Figure 23, confirming that this is the same firm.



PATENT SPECIFICATION

324,494

Convention Date (Switzerland): Dec. 1, 1928.

I, FREDERIC BAUMGARTNER, of 13, Coulouvrenière, Geneva, Switzerland, of Swiss nationality, 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 a watch of the type comprising a watch case which is enclosed in a separate outer case formed of two members.

Figure 21. U.K. version of Swiss patent CH 135793.

Brevets d'invention

Modifications:

Cl. 71 f, No. 135793. 1er décembre 1928, 15 ½ h. — Montre. — *Frédéric Baumgartner*, fabricant-bijoutier, Genève (Suisse). Mandataire: A. Bugnion, Genève. *Transmission* du 1er juillet 1930, en faveur des *Fabriques des Montres Zénith, succ. de Fabriques des Montres Zénith Georges Favre-Jacot et Co.*, Le Locle (Suisse). Mandataire: A. Bugnion, Genève; enregistrement du 4 juillet 1930.

Figure 22. *La Fédération Horlogère Suisse*,[6] August 16, 1939.

Apart from the three patents for variants of the rectangular clip back case used for the Omega Marine Standard, registered in 1940-1941, none of Baumgartner's other patents concern waterproof watchcases. And I found no patents granted to Baumgartner after CH 220263 in 1941, for waterproof or any other type of watchcase.

The announcement in *La Fédération Horlogère Suisse* shown in Figure 22 records the rights to the first of Baumgartner's patents CH 135793 being transferred to the watchmakers Zenith. In this announcement Frédéric Baumgartner is described as a fabricant-bijoutier [jewelry-manufacturer].

The quarter-page advertisement in Figure 23 is from the 1939 edition of *La Classification Horlogère....*[4] The advertisement says that Frédéric Baumgartner is a manufacturer of jewelry-watches [manufacture de bijoux-montres] and that they make watchcases in gold, platinum, and staybrite stainless steel, of very fine quality [*qualité très soignée*]. Essentially the same advertisement was run in the 1949 edition of *La Classification Horlogère*, but the address given in that advertisement was 36 Rue des Maraîch-

Manufacture de Bijoux - Montres

F. BAUMGARTNER

COULOUVRENIÈRE, 13

GENÈVE

BOITES DE MONTRES OR, PLATINE ET ACIER INOXYDABLE STAYBRITE

Qualité très soignée

Figure 23, right. 1939 Frédéric Baumgartner advertisement.

PATENTS GRANTED TO FRÉDÉRIC BAUMGARTNER

Number	Priority date	Title	Subject
CH 220263	1941-06-30	Boîte de montre étanché	Third rectangular clip-back waterproof watch patent.
CH 216460	1940-08-28	Boîte de montre-bracelet	Second rectangular clip-back waterproof watch patent.
CH 215449	1940-08-28	Boîte de montre étanché	First rectangular clip-back waterproof watch patent.
CH 205590	1938-05-09	Montre-bracelet	Method of attaching strap to watchcase.
CH 187166	1935-11-11	Montre-bracelet	Method of attaching strap to watchcase.
CH 148031	1929-09-23	Pièce d'horlogerie	Flip open case for a small clock.
CH 138646	1929-09-23	Pièce d'horlogerie	Flip open case for a small clock.
CH 135793	1928-12-01	Montre	Protective case for pocket watch.

ers. The index to the 1949 volume gives the name of the advertiser as Frédéric Baumgartner, confirming that it is the same firm with different premises, presumably due to development of the business.

There is no mention of waterproof watchcases in the 1939 Baumgartner advertisement, even though it was created long after the 1932 Omega Marine, and must have been drafted shortly before the 1939 Marine Standard was launched. The 1949 advertisement used the same wording, again with no mention of waterproof watchcases. Contrast these Baumgartner advertisements with the full-page advertisement by Taubert & Fils (Figure 24) and Piquerez-Frésard (Figure 25) in the 1939 book. These were watch casemakers specializing in waterproof watchcases. The watch in the Taubert advertisement is not exactly strapped around the submarine—more draped across it. But the meaning is clear, the watch is being dashed by waves but is not harmed by them, and just in case there is any doubt, the headline drives the point home "The waterproof watch par excellence" (étanche literally means "tight" but is most accurately rendered in English as "waterproof"). The Piquerez-Frésard advertisement shows a watch being dashed by waves, and again the meaning is clear. The tag line says that the company specializes in waterproof watchcases, and shows a helmet diver as a registered trademark. Contrast these advertisements with the sober Baumgartner advertisements for "Bijoux-Montres" with no mention of "étanche."

Figure 24, above. A Taubert & Fils advertisement.

Figure 25, below. A Piquerez-Frésard advertisement.

Knowing the correct name and addresses for the company, I was able to discover that the firm of Frédéric Baumgartner was founded in Geneva in 1917. It specialized in the manufacture of watchcases and jewelry-watches in stainless steel, gold, and platinum. Chinese staff were employed for their expertise in the manufacture of lacquered items.[5] The first factory was at 13 Rue de la Coulouvrenière in Geneva, later moving to larger premises at 36 Rue des Maraîchers. After Frédéric Baumgartner's death in 1964 the business was continued by his widow, and a new factory was built in the Acacias, a district divided between the city of Geneva and the town of Carouge, with more space for commercial developments. When Baumgartner's widow died in the early 1970s the company was taken over by Georges Piaget & Co., based in La Côte-aux-Fees and in 1976 was renamed Prodor SA. By this time the company specialized in the manufacture of gold watchcases and watch accessories, bracelets, and jewelry. Prodor was taken over by the Vendôme Luxury Group, which was subsequently acquired by the Compagnie Financière Richemont AG and on October 4, 2002, Prodor, then called Prodor SA Societé de production de boîtes or et de joaillerie [gold watchcases and jewelry], was dissolved without liquidation and Richemont International SA took over the assets and liabilities. But although the name ceased to exist, the factory continued.

So Frédéric Baumgartner manufactured jewelry and fine watchcases but didn't specialize in waterproof watches. Why would they suddenly start making waterproof cases and then equally suddenly stop? The coincidence of Louis Alix, a jeweler, securing a patent on the design used for the Marine case, and then Baumgartner, a jewelry and watch casemaker only a few streets away from Alix, manufacturing these cases for the 1932 Omega Marine, provides circumstantial evidence that Baumgartner got into waterproof watchcases by chance, just due to their common trade and proximity of places of work. It is evident that manufacturing the case for the Omega Marine didn't launch Baumgartner into competing with Taubert and Piquerez-Frésard because, although it is unlikely that the Marine sold in sufficient quantities to fully occupy Baumgartner's factory for seven years, this was how long it took until the Baumgartner-designed case for the 1939 Omega Marine Standard came along.

After Rolex launched the waterproof Oyster in 1926, the idea took off rapidly, and in the 1930s every watchmaker would have wanted to have a waterproof model in their range. Perhaps Baumgartner envisaged Louis Alix's patented design as his entré into this line of work. But it evidently didn't take off, because the cases for the Marine and Marine Standard seem to have been the only waterproof cases Baumgartner ever produced. Perhaps they found that the difficulties of maintaining the high production standards required to guarantee that every case was waterproof, or in dealing with customer complaints of leaks, which didn't apply to the bulk of their production, meant the exercise wasn't sufficiently profitable, and they just gave up after the height of the fashion had passed.

Frédéric Baumgartner's registered Poinçin de Maître was canceled on May 4, 1973, after the takeover by Georges Piaget & Co., but there were no patents granted to them for waterproof cases after CH 220263 was published in 1942. It is possible that they produced waterproof cases of different designs that were not patented. After the patenting frenzy of the 1920s and 1930s, many of the basic features needed for a waterproof case: screw-down crown, screw back, etc., came off patent in the 1940s and 1950s and then could be copied by anyone, so Baumgartner could even have made screw back cases with screw-down crowns, without a patent. The only way to tell will be to look for Baumgartner's Poinçin de Maître of a Geneva key with the number 2 on its lever in a gold or platinum case. If you have a watch with a waterproof case from the 1930s or 1940s or later in gold or platinum, look out for this tiny mark inside the case back; if you find one, please let me know!

CONCLUDING REMARKS

Although the 1932 Omega Marine Standard was the first true diver's watch, it was a bit of a deadend for Omega. It was expensive to produce and awkward in daily use, needing to be slid out of its casing every day for winding. Was it the protype of today's Omega dive watch, the Seamaster? No.

. . . and yet; maybe . . .

Although the Seamaster doesn't trace its technical lineage directly back to the Marine, the experience of making and testing—and actually selling and servicing—watches designed to be waterproof at diving depths in the 1930s must have been valuable experience for Omega. The lessons learned in those early days must have fed into the many waterproof watches produced by Omega in the years since. So in some sense, all Omega waterproof watches really can trace their ancestry back to 1932 and to those first tests in the cold waters of Lake Geneva.

The Marine Standard is something else altogether. Although it was not Omega's first waterproof standard watch—the first was the Naïad in 1937—the rectangular case shape was very much in vogue when it was introduced in 1939, and Baumgartner appears to have made many of these cases for other watchmakers, as well as Omega. The benefit of wearing a waterproof watch in terms of not having to worry about getting it splashed or getting rained on must have been a cause of relief to many who enjoyed outdoor pursuits, and so it is not surprising that it was a commercial success.

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6. *La Fédération Horlogère Suisse* - journal of the Swiss Chamber of Watchmaking. Published twice weekly in La Chaux-de-fonds by Haasenstein & Vogler.

ACKNOWLEDGMENTS

I thank Frank Bird for the pictures of the Omega Marine, Mike Katz of www.clockfixer.com for the pictures of the Tissot Marine, Jeff Chiang of www.oldwatch.club.tw for the pictures of the Omega Marine Standard, and TimeZone member candle7 for the image of the Patek Philippe case back. I also thank Brandon Thomas at the Omega Museum for his help in compiling this article. Any mistakes, errors, and omissions are entirely my own, and I would gratefully receive any additional information on these watches, or comments or corrections, either by email or via the editor.

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David Boettcher lives in Cheshire, England. He worked for 20 years in nuclear power construction before working for himself. He holds a degree in Engineering Science from the University of Bath, is a Chartered Engineer, a member of the Institute of Engineering and Technology, and a registered European Engineer. He has pursued careers in retail and IT and now works as a freelance engineer and IT consultant. His interest in vintage wristwatches was sparked when he inherited his grandfather's 1918 silver Rolex and grandmother's 1917 gold Rolex wristwatches. His website is www.VintageWatchStraps.com, and he welcomes comments or questions by email to David.B.Boettcher@gmail.com.