

BREGUET.

(1747-1823.)



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To Mr. Henry Weston  
from his old friend, the author  
July 1921



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# BREGUET.

(1747—1823.)



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## ADDENDA.

The watches described at the end of the book came to the notice of the Author after the volume was in the press, and have therefore been included in the form of an addenda. See page 223 *et seq.*

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## ERRATA.

- Page 1. 2nd paragraph, line 3 : Omit *most*.  
Page 35. No. 19 : Read *Schickler* for *Schlicker*.  
Page 73. Line 7 : Read *are* for *is*.  
Page 79. Line 1 : Read *consulte* for *consulté*.  
Page 79. 2nd paragraph, line 2 : Read *l'effet* for *l'effect*.  
Page 87. Line 9 : Read *entièrement* for *entirement*.  
Page 100. 6th paragraph : Read *ouvrages* for *ouvrage*.  
Page 101. Line 3 : Read *mesurer* for *mesure*.  
Page 105. Last paragraph : Read *la* for *les*.



## ERRATA.

- Page 11 : Six lines from top : Read *Louis XVIII.* for *Louis XVI.*  
Page 13 : Six lines from bottom : Read *nor* for *or.*  
Page 15 . Twenty lines from top : Read *instances* for *an instance.*  
Page 21 . Eight lines from top : Read *reformed* for *reform.*  
Page 28 : Nine lines from bottom : Read *hole* for *square.*  
Page 31 : Five lines from bottom : Read *faster* for *slower.*  
Page 62 : Third line from top : Read *Mugnier* for *Mungier.*

## ERRATA.

Many errors exist in the French part. Some existed in the original notices, and these are allowed to remain. A large portion of these notices were copied in manuscript and difficult to decipher. The following are the more important errors. A few were dealt with in the First Errata.

- Page 93 Line 2 from top : For *vouler* read *pousser.*  
Page 94 Line 6 from bottom : For *der* read *fer.*  
Page 94 Last line : Read *l'air* for *la'ir.*  
Page 99 Line 7 from bottom : Read *être* for *etre.*  
Page 99. Line 3 from bottom : Read *nécessaire* for *necessaire.*  
Page 100. Line 2 : Read *isolé* for *isolè.*  
Page 100. Line 3, para. 2 : Read *à* for *a.*  
Page 101. Line 3 : Read *mesurer* for *mesure.*  
Page 101. Line 1, para. 2 : Read *déjà* for *déjà.*  
Page 102. Line 5, para. 2 : Read *dela* for *déjà.*  
Page 102. Line 9, para. 2 : Read *celuici se trouve* for *celui à trouve.*  
Page 102. Line 6, para. 3 : Read *acquèrèment* for *acquirement.*  
Page 103. Line 3, para. 4 : Delete *et.*  
Page 103. Line 6, para. 4 : For *de se* read *des.*  
Page 104. Line 3 : Read *complèter* for *complete.*  
Page 105. Line 2 : Read *qui un* for *qui'on.*  
Page 106. Line 6 : Read *barillets* for *barillet.*  
Page 107. Line 10 from bottom : Read *à* for *a.*  
Page 108. Line 8 : Read *à* for *a.*  
Page 108. Line 10 : Read *eu* for *ou.*  
Page 110. Line 10 : Read *expèrience* for *expérience.*







BREGUET

# BREGUET.

(1747—1823.)

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BY

SIR DAVID LIONEL SALOMONS, Bt.

M.A., F.R.A.S., M.Inst.E.E., A.Inst.C.E., &c.

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DEDICATED TO  
MY WIFE  
IN COMMEMORATION OF A PARTNERSHIP  
OF NEARLY FORTY YEARS.

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## NOTE BY THE AUTHOR.

IN compiling this little work, the only credit that I can claim is for the time and labour expended in collecting and putting together the various facts and other details connected with the Life and Work of Breguet. Very little appears to be known of his life, but his works are so numerous and important that a survey of these is well worth consideration. When a century exists between the living man and a writer upon his activities the avoidance of errors is almost impossible. At the same time every care to be accurate as far as possible has been taken. Probably, the most interesting part of the following pages is that dealing with my Collection of Breguet's Productions for here is evidence standing before us to-day. The general information I have gained by consulting certain books such as the late Mr. Britten's works, the "Dictionnaire Larousse," "Histoire de l'Horlogerie" by Pierre Dubois, 1849, a work by Baron Ernouf, and others, though they gave but very little information. Mr. Hull, of the Firm of Messrs. Le Roy, in London, Mr. Henry Brown (who owns the Firm of Breguet in Paris to-day) and his son, Mr. George Brown, have assisted me in various ways, and to them I owe my thanks. But to Mr. Desoutter, of London, who has made a life-long study of Breguet's work, I owe special gratitude for lending me a number of pamphlets and other matter which he had collected concerning Breguet, and above all for his constant explanations of technical points connected with these clocks and watches, so difficult to understand except by those who have had a large experience in taking them to pieces and studying them, a fact which accounts largely for their scarcity to-day, so many having been destroyed by incompetent watch repairers. Indeed, I have seen a considerable number made worthless in this manner, also others where owners have had works altered, believing they could improve on Breguet.

DAVID L. SALOMONS.

January, 1921.



# BREGUET.

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## CHAPTER I.

### GENERAL AND PERSONAL.

**B**REGUET is known only by his productions. He never published a single sentence, but it is stated that he was engaged on a great work upon Horology, when a Call to another World stopped the enterprise. To obtain a mere glimpse of his life, many books must be consulted, and such glimpses only consist of a few pages or a few words. To obtain an account of his inventions, devices and work, the task is still more difficult. The late Mr. Britten, in his interesting books on "Old Clocks and Watches," and in other ones, gives but little information. No one, I believe, has attempted to write a short book or pamphlet on Breguet's work, and this want I am trying here to supply, though my pen cannot do full justice to so great an inventor and artist.

The reason for the absence of such a reference book is simple. Anything by Breguet and his Firm commands high prices, these productions are scarce, and few people, even most watchmakers, thoroughly understand his best work. Because they are scarce and dear, many idiots with money collect Breguet watches, although they are people who cannot distinguish between a fine watch and one worth "two and six." Collectors of this kind exist in abundance. How many are there who collect Old Masters and cannot see the difference between these and a coloured plate from the "Illustrated London News!" Yet these stupid people, who spend their money without deriving any pleasure, have a use in

the world. In the case of such a collector he preserves much that is of value from destruction for the enjoyment of the present and future generations. Yet this was not the reason why he started hoarding. But the collector who has a true love for the articles he buys is really a happy individual. Not only he himself has pleasure, but his knowledge helps to teach others numerous points of interest and often of practical use.

These pages have been written at the request of several friends and others, so it is not out of place to give a little piece of my personal history in connection with clocks and watches. There is also a moral in this history to show how little things lead to greater ones, in this instance to the preserving of many works of a great artist. It is also a lesson to parents to study and encourage the tastes of their children. In my own case, I was neither discouraged nor encouraged. My uncle, whose name I bear, had no children, and he was my guardian, for my parents died when I was young. He being constantly occupied in Parliament, I was left very much to myself to do as I liked. Having an excellent memory, my preparation lessons took but little time, and I had considerable leisure to follow my natural inclinations without hindrance. I was born a "mechanic." A mechanic cannot be made any more than a painter, a poet or a musician. When I was young, nurseries were not "toy shops" like they are to-day, and children were happier in consequence. I never cared for ordinary toys. A clockwork engine, some building bricks and a box of tools occupied me in my play time. I *did* want one thing more—a Statham's 10s. 6d. "Chemical Cabinet for Youths." For years I looked into the window of a chemist shop where some were displayed in the King's Road at Brighton, but my 10s. 6d. was not to be forthcoming for a long time. Looking back from my age to-day to that period, it may have been a merciful thing for the household that I did not possess the chemicals then. But I so wished for them, yet, be it said, if we have nothing to desire, life would fall extremely flat. At the age of fourteen I was so interested in watchwork, that I made friends with a little working watch repairer, and I induced him to let me come into his shop from time to time in the evening, to learn to make pivots and do other work, also to repair jewellery. Proving a good pupil, as anyone does who is interested in his pursuits, he gave me much



of his work to repair at home for his customers. I scraped together enough money to buy the tools required which were not many. At other times, I wandered in the evenings around Clerkenwell and Soho, looking into tool shops, going in and asking questions which were readily answered, because the shop-keepers did not expect a timid boy would spend a fortune, and they all seemed to take an interest in me. The making of Charing Cross Road, Shaftesbury Avenue, and the improvements around Clerkenwell, have swept away most of my old haunts and Time has swept away the faces I once knew so well.

Now I pass over many eventful years and come to the time when I was about twenty-three years of age or somewhat later. I had always heard Breguet's name spoken of with reverence, but had never seen any of his work. At the time mentioned, I was shewn at a shop in Regent Street, a 3-wheel Breguet clock. The price asked was £150. This I thought was too dear, and, further, I did not deem myself a good enough judge to be sure that the clock was original. So I studied it carefully in my mind and left it for another to buy. Many years again elapsed, when I spoke to a leading watchmaker in Paris about Breguet. He told me there were so many forgeries about, which were hardly to be distinguished from originals, that I was "put off" from seeking these watches, since I make it a rule never to buy on my own judgment until I have had proper experience. Some years later still, about 1915 or 1916, I called at a well-known shop in New Bond Street. The Head of the Firm showed me a "self-winding" watch by Breguet which only required a slight repair, due to some inexperienced watchmaker having broken a wheel. I was pointed out and explained all the complicated details and the beauty of Breguet's workmanship. I bought the watch and spent many hours in studying it. Thus I came to appreciate the work of this Master of Horology, and henceforward took the greatest interest in all his productions, which are now very rarely to be met with. Luck was on my side, and soon after the purchase of this watch, I was shown another (bought at Christies, I believe) which belonged to George III. The back was enamelled, so I refused it, knowing that a watch gives no pleasure unless worn at times, and it would be certain that I should sooner or later break the enamel. This watch, I was told, eventually went to America.

I now come to the year 1917, on May 3rd, a pouring wet day, when I passed a shop set back from the pavement near Regent Street, into the window of which I had never looked, as only modern jewellery was displayed. My attention was attracted by a curious-looking watch differing from the usual display, and I saw a notice by its side, bearing the name "Marie Antoinette." I then went up to the window to have a better look at the watch, and I saw that it had been made for that ill-fated Queen by Breguet, and was his masterpiece. A high price was put on it, and I went on to my house in Grosvenor Street, calculating all the way: "Could I afford this?" I then sat down to answer some letters, but all the time the reflection passed through my mind that such a watch could not stop long in that window if the rain ceased. Having come to the conclusion that I could offer a certain figure, I put on a waterproof and started back to the shop. The owner, I found, had made a special study of Breguet's work throughout his life. It is against my principles to make "offers," but when he told me the watch was being sold on commission, I was free to offer the price I proposed to give. I examined the timepiece, which is perfect, and said if he could let me have the reply to my offer by 10 a.m. the next morning, I should still be at home. At 9.30 the next morning, the vendor arrived with the watch, and said my price if advanced £50 would be accepted. I could not quarrel over the extra £50, so I gave a cheque and kept the watch. It turned out to be a good purchase, judging from seducing offers made to me later on to part with it. Evening after evening, I studied this watch, which is most complex and interesting, with the result that I formed the opinion that no other maker of watches could approach such work, and I have had considerable experience of the productions of other makers.

Almost every Breguet watch of note has passed through, and does now pass through the hands of the gentleman who sold me the "Marie-Antoinette" watch, though they are few. Hence I have been able by his aid to obtain some fine specimens. In March, 1920, I heard that an important collection, sixteen in number, of Breguet's watches, was to be sold privately. Eventually they came into my possession. Not long afterwards, another and the best known Collection of Breguet's watches was to be sold at Christies, but upon advice, the owner agreed to sell it

intact if possible, since it was undesirable to disperse such a Collection if it could be kept together. It consisted of 52 watches, and these also passed into my possession. After some weeding out, there remained 87 Breguet watches, and these form my present Collection of this Master, the possession of which I do not regret, since by the study of them I am enabled to give in a succeeding chapter, some interesting details. To carry a fine Breguet watch is to feel that you have the brains of a genius in your pocket.

My object is not to advertise my Collection, which is now said to be the largest and most varied of the kind, for I dislike advertisement. I made it with an object, viz., to study Breguet's genius, and one day to publish some record of his work. This has never yet been done, because the former owners of these watches were not technical; also because the watches were dispersed in so many hands. It is the old story that "All water runs to the sea." On one occasion a Breguet self-winder was held back from a dealer to show me as a matter of interest only. It was a flagrant forgery, and the price asked £80. This I found had been offered to and refused by another watchmaker previously. A few days afterwards, a dealer in antique jewellery wrote to me that he was offered a fine self-winding Breguet watch with a remarkable escapement, price £135, but being no judge of these, he would like me to see it. I did so, and the "old friend" appeared again. Two months afterwards, I was in Breguets' shop in Paris, when someone came in and left a watch to obtain a certificate of genuineness. It was the same watch again, pursuing me like the "Unlucky Slipper." I expressed my view that probably the plates of the watch and one or two wheels were correct; possibly the worn case also. However, the case was a forgery too, the escapement as well. There are many such forgeries about, although a few pieces in such watches may have come from Breguet's workshops. In the course of manufacture, many watches are started and advanced more or less, then for some reason thrown aside. These were taken away by workmen, finished on their own account and sold. Parts were sold to dishonest persons who finished the watches in a very different manner and sold them to the ignorant as genuine. This is why it is often a difficult matter to judge, because a part of the work may appear right and part wrong.

Likewise, some clever people thought they could improve upon Breguet, and get a watch of his "modernised." Large numbers of fine specimens have been destroyed in this way. Others have been ruined in "cleaning" by inexpert watchmakers, and others through never being cleaned at all, but "worked to death." All this accounts for the rarity of these watches to-day.

The judging of the make of a watch is often ridiculed by the uninitiated, and this reminds me of the parallel story of the wine-taster told by the late Dr. Tidy, who was one of the jurors at the 1873 Exhibition at Vienna. One evening a number of the jurors, a celebrated wine-taster among them, were dining together. This expert was chaffed about wine-tasting, which was said to be all imaginary. He replied: "Give me a trial." His eyes were bandaged, and various wines given him to decide. In each case he was right as to the wine and the vintage. This was too much for the others, so they decided to mix two nearly similar wines together, and see the result. The expert was greatly puzzled. He said: "When I put the wine in one cheek it is this, and in the other one it is that." Then they all laughed, for the taster was right, and his special knowledge was admitted. It is exactly so with watches made by two men of unequal skill. Those accustomed to examining the work of particular makers, can form a very good opinion as to the genuineness of the article.

I will conclude this Chapter by saying there must be something in heredity. My great-grandfather was a well-known mathematician and astronomer, and my father an expert on works of Art who formed a large Collection. Thus it comes about that I admire the beautiful when combined with mechanics.

## CHAPTER II.

## THE FIRM OF BREGUET.

THE Founder of Breguet's Firm was Abraham Louis Breguet, born in Switzerland, of French origin, in 1747, and apprenticed to a Versailles watchmaker in 1762 when aged fifteen. The date when he started his celebrated establishment in Paris cannot be accurately fixed, at any rate, he was quite a young man at the time, possibly when twenty-two years old in 1769, and he rose immediately to success. He died in Paris in 1823. About the year 1807 Breguet took into partnership his son Louis Antoine, who was born in Paris in 1776. The name of the Firm was then changed from "Breguet" to "Breguet et Fils." The probable date of partnership can only be obtained by the examination of a number of watches. This son retired in 1833, but lived on till the year 1858, and died at Buisson, near Mennecey. When Louis Antoine retired, he was followed by his son Louis Clément François, who was born in 1804 at some place unknown, and died in Paris in October, 1883. He had a son named Louis Antoine, born in Paris in 1851, and died there in 1882. This was the last of the Breguets in the Firm, for although he left a widow, two sons and a daughter, they did not enter the business. This Louis, the last of the Breguets, was a great horologist, but was overshadowed by the fame of his ancestor. Up to this date, viz., 1882, all that was issued from the Firm was of the highest order and the touch of the Past maintained. Since that date, though the work is not inferior, it naturally follows the modern fashion of design and construction.

The last of the Breguets, seeing that he had no one of his family likely to follow him, looked round for someone suitable to make a partner and continue the Firm after his time. He knew a first-class mechanic in Clerkenwell named Edward Brown,

who was induced to go to Paris to look after the factory. Eventually he became a partner, and later the owner and the head of the Breguet Firm. Edward Brown died, aged 66, in 1895, and was succeeded by his two sons Edward and Henry, of whom Edward retired, although still alive to-day, 1920. Thus Monsieur Henry Brown became the Head of Breguet's Firm and is so to-day. He is not so interested in horology as his predecessors, but he has a son named George destined to succeed him, who is now young and clever in the art.

Breguet's first known address in Paris was 51 Quai de l'Horloge, then 79 Quai de l'Horloge du Palais, about the year 1812.\* Probably the latter address was merely a change of number and of name and not actually a change of residence, and it was at this house that Breguet died. In 1823 Breguet also had a shop, 4 Place de la Bourse, for the two addresses appear on the underside of the original leather case of Watch 4004 (Collection No. 64) which was sold September 1st, 1823. The Firm then moved to Rue de la Paix, and not long since to the present address at 2 Rue Edouard VII.

\* Number to-day is 39.

## CHAPTER III.

## THE LIFE OF BREGUET.

AT Neuchatel in Switzerland, on January 10th, 1747, Abraham Louis Breguet\* was born. His ancestors were French, having fled from France after the Revocation of the Edict of Nantes in 1685 on account of their being Protestants, and Protestants they remained until the end. Breguet's father died when he was only ten years old, and he saw no more schooldays after the age of twelve. His mother, who was young, married again a watchmaker who tried to interest his stepson in the trade, but for a long time without avail. Eventually he took to mechanics with much enthusiasm, and being dissatisfied with the Swiss work of the time, which may be described as "only good enough and nothing better," it was decided to apprentice him to a watchmaker at Versailles when he was fifteen years old. This would be in the year 1762, a period when the Court had great influence on the trade, and the best watchmakers established themselves around it at Versailles.

He was not long there before he astonished his master by his aptitude and intelligence. Indeed, young Breguet finding that mathematics was essential to success in his trade, attended evening classes on that subject at the Collège Mazarin under the Abbé Marie. Though Abbé Marie was a Catholic and Breguet a Protestant, yet he took the greatest interest in his pupil, befriending him not only when at the school but afterwards. This Abbé had a tragic end. Some say that he was assassinated, and others that he committed suicide, the latter opinion being based upon the fact that he had a brother who was insane. Not long after Breguet had been apprenticed, he lost his mother, also his step-father. He was therefore left alone in the world to support himself, and a sister younger than himself, there being no others in the family. How he managed this, and what happened between that period

\*The Firm of Breguet state the name should be Louis Abraham Breguet, and not as given. However, he is always spoken of as Abraham Louis Breguet.

and the time when he started on his own account in Paris, probably about the year 1769, is lost to history.

By degrees, Breguet rose to fame. During his time he became acquainted with Marat and friendly with him. One day Marat was with Breguet at the rooms of a friend, when a crowd collected outside crying "Down with Marat." Things looked dangerous, so Breguet dressed Marat up as an old woman and they left the house arm-in-arm unmolested. This good turn was remembered at a later date by the Revolutionary, who found that Breguet was singled out for the guillotine, possibly because it had been discovered that the Abbé Marie had been friendly with him. This was in the year 1793, and Marat obtained for Breguet a "safe-pass," which enabled him instantly to leave France and reach Switzerland. Thence he came to England, where he remained for two years and worked for George III., who was very fond of mechanics, also for other notable people. When the atmosphere was calmer, he returned to Paris. About that period, John Arnold, the joint inventor of the chronometer used at the present day, was regarded as the first clock and watchmaker in Europe. The Duke of Orleans came to London about 1792 and met Arnold, when he showed him a watch that he had bought from Breguet. Arnold was so struck with the work that forthwith, notwithstanding the difficulties which existed for travelling at that time, he went straightway to Paris to meet Breguet and begged him to accept his son as an apprentice. The request was acceded to, and he remained with him two years.

The following pretty fact is recorded in Mr. Britten's book on "Old Clocks and their Makers":—Breguet invented the Tourbillon and John Arnold invented the chronometer escapement at the same time as did Thomas Earnshaw in England. Breguet gave Arnolds' son a silver watch by John Arnold to which Breguet had added his famous Tourbillon. This watch bears the following inscription on part of the works:—"Premier régulateur à Tourbillon de Breguet réuni a un des premiers ouvrages d'Arnold. Homage de Breguet à la mémoire révéree d'Arnold offert a son fils. An 1803." The workmanship is first class. The watch belonged to Mr. Hurcomb, who may still possess it.

It may be observed in passing that a generous friend in London, named M. Desnay-Flytche, gave Breguet a pocket book,



stuffed with Bank-notes, in order that he should be spared want when he came to England. This gift enabled him to continue his researches and his work. Breguet's end was sudden. He was on a Jury for an Exhibition of Industrial Products in 1823 and just after the conclusion of his work, he died suddenly on September 17th, 1823. Louis XVI., shortly before his death, nominated him for the great honour of Member of the Institute of France. Arago gave the funeral oration at his grave, together with other great men, and Népomucène Le Mercier composed some verses to his memory. To the end, Breguet followed his simple mode of life, although he mixed with some of the highest society of his day. Although Breguet was stated never to have published a single line, having been so engrossed in his work throughout his life, it is said that just before he died, he had started a great work dealing with horology.

Breguet was known throughout his life for his good humour and kindness. It is recorded that when a workman brought him a piece of work and tendered a piece of paper showing the amount to be paid, if he thought that all was satisfactory and the figure ended in a zero, he put a tail to the 0 making it a 9, thus making the price to be paid nine francs more than was asked. The young man in Breguet's factory was always encouraged with the words "Do not be discouraged, or allow failure to dishearten you." In the year 1884 his house by the Seine was still in existence with his name on it, viz., 79 Quai de l'Horloge du Palais, and the house is there to-day, but the name upon it has gone.

Abbé Marie was able to do a very good turn for Breguet, for the Abbé became the tutor of the Dukes of Angoulême and de Berri. He was thus able to obtain an introduction to Louis XVI. for Breguet, and the King having mechanical tastes gave him many orders, one being for a "perpetuelle" watch, *i.e.*, a self-winder, which specially pleased him.

Breguet was young to the end and never became proud through his success. He was universally esteemed, since he was modest and not envious of anyone. Indeed he was so retiring that many of his inventions were kept secret for a long time, not for the sake of secrecy as many thought at the time, but purely out of modesty. In course of time he became wealthy, but notwithstanding this he continued the simple life to the end. With age, his

only failing was deafness, and eventually he became completely deaf, but he was never morose, which is the usual result of this malady.

In the whole course of his life, he was only spoken or written against on one or two occasions by envious or disappointed persons. Once by the inventor of a telegraphic system in vogue at the time named Chappe, who was angry because a committee of experts had reported favourably upon a new telegraphic system invented by Breguet, in conjunction with a Spanish engineer of French origin named Bethencourt y Molina, also one or two others who said that Breguet only made watches for the fashion and not for the sake of scientific principles.

In regard to the latter accusation, it is true that Breguet sacrificed very often certain points of construction to obtain thin watches, but this was absolutely necessary because the dress of the period did not allow the old-fashioned "potato" watches to be worn, or as they were called in France "onions," but Breguet's best work sacrificed nothing although the watches were very thin, and some cases somewhat thicker than he desired. In these thin watches he had to give up the fusee and alter certain points, also pierce the barrel arbor to reduce the size and thickness.

To obtain good results, he put in some most ingenious arrangements to make up for the absence of the fusee. In his fine watches of precision, such as the Tourbillon and others, he recognised the desirability of the fusee and other essentials for obtaining accuracy and they are invariably present. In modern watches the fusee is almost always absent; indeed it is not necessary except in marine chronometers and in watches which may compare with them.

The technical points of interest to be found in Breguet's work are dealt with in another chapter.

After Breguet's death, an Englishman wrote against him in the same spirit of jealousy as those before mentioned; also another Frenchman who said that with Breguet's genius and the power that he had even over kings, he could have forced upon them anything that he pleased. However, all these attacks counted for little, for it was recognised that Breguet had either invented or improved upon previous inventions, everything that was good in

his time, and since these are still used to-day, it must be recognised that he was a great man. Indeed no better timepieces were made before his time nor since. Some of his best inventions are rarely seen at the present time except in the finest work, on account of the great expense necessary and the difficulty of finding sufficiently skilled workmen.

In Breguet's time there was only one Breguet and no watch of importance could be anything but a "Breguet." It may be truly said that all good watchmakers of his period, and for a long time after, were those who had been his pupils or his workmen, men like Winnerl who invented the chronograph, Raby, Mugnier, and a host of others. In fact, the productions of these latter watchmakers were equal to what was turned out at Breguet's factory in every respect, and may in a sense be regarded as Breguet's work. Breguet stated that he could find only 15 to 20 workmen in Paris capable of carrying out his work properly, and no man received less than 20 francs a day. He had the great compliment paid to him, but a very disagreeable one, that a host of imitators sprung up who copied Breguet's work very closely and placed his name upon their productions. In other words, forgeries appeared on all sides, and the fashion became so great that many watches made before Breguet was born have the word "Breguet" engraved upon them. I have several myself in this condition, but they were not purchased as Breguet's work but because they had automatons or some other curious detail which might amuse people.

Breguet was equal to the occasion, and he invented a pantograph which enabled him to engrave on a dial whether of enamel or metal the number of the watch and his signature so small that it could only be distinguished with a magnifier. I have been told that the method by which the engraving was done was to place upon the dial some diamond powder paste, then with a hardened point the tracing was made. So difficult must it have been to do this engraving properly that I have never heard of or seen any forgery of it. It is not easy to give a date when this secret signature was started, even in watches of the same date, some have it and some have not which may be due to many reasons. In some cases, in cleaning the dial the signature has been rubbed off. In others the dial has been replaced, and possibly in some instances

the signature was never put on, so that the absence of signature is no proof that the watch is a forgery. It must also be remembered that on reaching the figures 5999, a new series was started. Consequently, no genuine Breguet carries the number 6 for the first figure. There are many forgeries which bear higher numbers than 6000, the intention probably being to deceive the customer but not the trade.

Breguet made only three series of watches, and one series only reached 5120. Thus about 17,000 watches, including the "Souscriptions," were issued by him.

In regard to Breguet's "perpetuelle" watches which are on the pedometer model, *i.e.*, the motion of the wearer keeps the mainspring wound up, was not actually of his invention. It has been stated that in the year 1780 Recordon patented a self-winder upon this principle, and it is not known whether Breguet made his first one before or after that date, but it is certain that neither of these makers invented the principle, for I possess a watch made in Vienna a great deal older than either, and it works very well. The watch does not bear the name of the maker. One thing is certain, that the only self-winders which are entirely satisfactory are those made by Breguet.

In order to ensure certainty of action and no possibility of injury due to over-winding or shocks, most ingenious devices are introduced which naturally increased the expense of production, and few people to-day would be willing to pay the cost, even if workpeople could be found to make such watches.

To make the watch more "perpetuelle," if one may use the expression, the cases of these watches are so designed that they can only be opened by a watchmaker, so as to prevent the possibility of dust getting into the works, and it is said that eight years may elapse without cleaning the watch and no harm will be done. In Breguet's time, electric light, gas, petroleum oil lamps, also matches were unknown. Therefore to get a light of which we think nothing to-day must have been a very troublesome affair. This gives the reason why such a very large number of the watches made at that period were repeaters, and what are known as blind men's watches, or as they are called in France "à tact."

One of the most difficult tasks which presents itself to a watchmaker is that of correcting a watch for position. Breguet invented

a Tourbillon to remove the trouble almost entirely. The device consists of the whole of the escapement, including the balance, being carried on a little platform which revolves once in a minute or slower. Consequently, if any part of the escapement is out of poise, it is "averaged" by the fact that it is turning round itself, at the same time that the balance is vibrating.

Breguet also invented the "parachute," or as he sometimes called it "elastic suspension" used in connection with the balance staff pivots, which pivots were made not as usual but in the shape of cones. Hence if a watch received a great shock, the balance pivots will be unbroken since the suspensions were elastic.

It is said that Breguet was at a reception given by Talleyrand when he took his watch and dropped it on the ground. Talleyrand called out "*Ce diable de Breguet veut toujours faire autrement que mieux,*" and to the astonishment of the company, on picking up the watch it was found uninjured.

Breguet was very broad minded. He accepted foreign inventions on a par with those of his own country, unlike his great contemporary Ferdinand Berthoud, who rejected all except French inventions. To give an instance, Breguet improved upon Graham's dead beat escapement, the cylinder and the chronometer escapements, also others. His work was not confined to clocks and watches. He made a number of instruments connected with physics and astronomy, and amongst other things a thermometer consisting of a spiral of three metals soldered together, said to be the most sensitive in the World, and described by Arago as being as sensitive as a human being. There is one of these at the museum of the Institute of France. The greatest clockmaker of the time was Antibes Janvier, whose work was mainly known in regard to astronomical clocks, and it was suggested that Breguet and Janvier should go into partnership, but according to Raby, the project fell through owing to the difficulty which arose as to whose name should stand first.

The price of this Artist's watches must not be taken as a criterion of the class of work. He had friends and patrons, and for them, it would appear, favourable prices were made. Amongst these persons can be counted the Duc de Praslin, Comte Demidoff, Lucien Bonaparte, etc. Napoleon took much interest in mechanics and visited Breguet's factory, incognito, from time

to time. The Allies were good customers. The Duke of Wellington purchased a "Breguet" for 300 guineas, which he always wore. The Tsar of Russia bought a great many. Other clients were the Duc and Duchesse de Berri, Lord Londonderry, Lord Beauchamp, Lord Bruce and Lord Chesterfield.

Breguet was always ready to meet any suggestion made to him, and his genius found the way to get over every difficulty.

Most people have been heard to say: "Since my watch has been cleaned, it has never gone so well as before," and this is very often true, even of a watch of the best class. The reason is this: Modern watches are almost entirely machine made. A machine wears, as do all things. Consequently parts made with any machine only remain alike for a certain time, but when the variation starts to show itself, it is so small that to adjust the machine for wear is practically impossible. In a factory some machines do more work than others, hence wear is unequal. Also every machine is not brand new, though this may have been so when the factory opened. Consequently, in course of time, the watch parts produced are not identical in size, yet very nearly so.

A watch, with such parts assembled, when taken to pieces, will never be put together again exactly as it was before, and it is these minute differences which make the difference, causing this remark made by so many. On the other hand, a fine hand-made watch is corrected for size as the work proceeds, thus can be taken apart, then put together again exactly as it was originally.

A good watchmaker must have a peculiar temperament. He must have a good eye and a steady hand, also decision in his manner of working. Besides these qualities, he must possess unlimited patience, be interested in his work, calm in temper and ingenious. Some nations possess these qualities more than others, and the Swiss appear, in general, to have characters suitable for this special trade.

To navigate the seas, an accurate Time-keeper is essential, and Clockmakers were greatly encouraged to produce these by the State nearly 200 years ago. Other countries besides England acted in the same manner. In those years gone by Clock and Watchmakers at the head of their profession were held in great

estimation, so much so, that Tompion and Graham were buried in Westminster Abbey. Even during Breguet's time the Craft was much honoured and esteemed. Since that period, the public has taken less and less interest in horology. To-day people in general take no interest at all in this Art, so vital for their daily life and comfort. This is greatly to be regretted, since many improvements possible are no longer sought for, and invention in this direction is allowed to die.

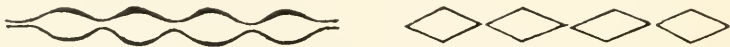
## CHAPTER IV.

## TECHNICAL.

TO deal with the technical points which are to be found in Breguet's work is not a very easy matter, since a great deal naturally overlaps with other inventors and makers. Therefore, in the following lines I have tried to keep myself as far as possible to the more special points which distinguish Breguet's work from that of other makers.

## WATCH CASES.

These are found almost invariably very simple. Those which were more decorative were no doubt so ordered by the clients, since the certificates show in such cases a separate price for any decorative portions found on the watch. The cases were either plain or more usually engine-turned, but the engine-turning employed is different to that of to-day, being what is called circular-engine-turned, *i.e.*, done with a rose-engine, and not eccentrically turned as now done. When the finger is passed over such rose-engine turning, the feeling is like that of silk, whereas the other kind conveys a rough sensation. The following diagram shows the difference when magnified:—



It will be noticed that in the modern method a number of points exist at the ends of the "diamonds" which are absent in the older method. There still exist to-day a few of the machines employed a hundred years ago, so that it is now possible to get engine turning done in the old method if the people possessing these tools can be found. Sometimes the pattern was concentric, sometimes eccentric. Breguet had several favourite models for



the cases, some shaped like old snuff boxes and others more like our modern watches. In all instances, the cases were elegant and are constantly being copied at the present time. The modern method is to solder the back into the bezel, but Breguet did not follow this way, and with rare exceptions the back is snapped in after the same manner as the front glass. This is found at times to be exceedingly convenient. The fronts and backs usually open by means of the nail, but the fitting is so good that no effort is required. In other instances, the back or front opens with a press or spring. Frequently, silver bodies were used, the remainder being gold, and various colours of gold were employed in order to give contrasts.

For repeating, many styles were in use. Sometimes the piston was at the bow, sometimes at the side of the body. At other times by means of a slide as in most modern watches. In the place of glass, Breguet always employed rock crystal. The inner dome sometimes hinged, sometimes snapped on, and at others was kept in place by an eccentric-headed or a shaped screw, so care must always be employed for removing the inner dome, for if the manner by which it is fixed is not first observed, some damage may be done. In some watches secret portrait places exist in the back, so well made as to be very difficult to detect, and to open these various ways have been found, of which very few are alike.

What we call a "hunter" the French call a "savonette," and Breguet's favourite method was to make this enclosing box quite separate from the watch, so that although it could be used as a hunter in the usual manner, yet by pressing a little spring the watch could come out of its case and be used separately if wished. In such watches it is usual to find that all adjustments can be made without opening the watch case, for regulation, the setting of the hands, and any other matters that may require doing can be carried out around the edge of the watch outside. In some cases small slides cover the holes, but not invariably.

Certain watches were stem winders at an early date, but do not appear to have been viewed with great favour till, say, after 1850. The bows in "perpetuelle" watches and in some others had little balls soldered to the ends to avoid all possibility of the bows being pulled out of the pendant. In other instances, the bow is a

complete ring, soldered at the joining place. The pendants, in general, were not fixed as they are to-day, but attached to metal blocks, gold or silver, which are hard-soldered to the cases and form part of it. In certain watches the rock crystal glass over the dial is pierced so that the hands might be set without opening the front. In Breguet's thin watches the back turned to uncover the winding hole or a little slide at the edge opened the hole, like a sliding trap door, and the barrel arbors being pierced, the key was pushed into a hollow square instead of being put on to a projecting square. In the case of blind men's watches the "facts" were sometimes level and sometimes separate, like an arrow. At times this portion did not open, but in some watches the back or the front, as it might be, which carries the "fact," can be opened and none of the arrangement upset.

On the backs inside, if they are the original, will be found the number of the watch and the letter B. Also another number sometimes with a letter, which refers to the maker of the case. Tavernier was a skilled case-maker employed by Breguet, so his initial is often found. The boxes in which the watches were sold were invariably covered with red morocco with two sunk places inside, one to receive the watch and the other any spare glasses. The under side of the boxes were covered with green morocco and stamped with Breguet's name and address, while on the lid the number of the watch was stamped. Also there was given with each watch a short gold chain and a key. Likewise there was given a certificate describing the watch, also to whom it was sold, the date of sale, its price and general details. It often happens that a certificate does not agree with the watch, since alterations may have been made at the time or after the purchase. Any watch taken back to the firm since its purchase and altered is entered upon their books so that a doubtful point can at any time be cleared up by enquiry. Breguet called his watches "Montres," "Garde-temps" and "Régulateurs," meaning "Watch," "Time-keeper" and "Regulator." The latter two names applied to watches of large size, where time-keeping was specially wanted, and all his Tourbillons he called "Régulateurs."

In regard to clock cases they were generally plain or in the Empire style of decoration to suit the taste of the day. There

were many silver case carriage clocks made which had chains in the place of handles to lift them by. There is no doubt the practice existed so that such clocks could be more easily fixed in a carriage, since a handle might be found in the way if it was desired to fix at the top in order to keep the clock steady.

Truly it may be said that Breguet reformed watches in the 18th Century as did Thomas Tompion in the 17th Century reform clocks. Before Tompion's time, the cases of clocks were regarded as more important than their interior, and dials were so decorated that the hands had to be searched for. I have in my possession a number of watches earlier than Breguet's period. I have also handled some hundreds and seen thousands which were made before, say, 1775. Without fear of contradiction, it may be said that without exception all these early watch cases were clumsy and wanting in elegance, and no thin watch existed. Many of these early productions are beautiful by way of decoration, such as jewelled work, repoussé, chased metals or fine enamel, but these had nothing to do with the watches. Indeed they are more suitable for little musical boxes, snuff boxes and bonbonnières, and many old watches are found converted to such articles. Now Breguet absolutely invented the thin watch and the small watch, besides making the cases most elegant. In fact, all our modern watches follow his design, but rarely so refined. Breguet's dials were also a complete departure from those existing at the time. Naturally the work had to be greatly modified to meet the small and thin watch for which he created the fashion and the demand. In doing this, there was no loss in efficiency, but the contrary.

#### DIALS AND HANDS.

There is one noticeable thing in Breguet's watch dials. In every case the time can easily be read, and where a watch was required solely to give the hour, and not for ornament, the dial was made as large as it was possible and all most distinct for the eye. Where phases of the moon are shown, frequently a point on the moon is made to indicate its age, but this had probably been done before his time. Breguet's dials were either enamel, silver or gold. Sometimes the dial was a mixture, partly of one kind and partly of another. The enamel which he used was

grainless, whereas English enamel dials show a slight grain under a magnifier. His silver dials are always beautiful. Modern attempts to imitate them have never been quite successful. There is no doubt he used some special alloy. Some say there was gold in it. But the silver colour is given a leaden hue, and the hardness is such that the engraving upon it looks much more delicate. These dials were usually engine turned, except the ring, and other parts, where the figures are placed. It is important before removing a dial from a Breguet watch to see how it is fixed, since the methods employed are frequently so different from the usual ones. In all instances the hands are hand-made in gold or steel and very simple but beautiful in regard to workmanship.

A variety of expedients are employed for setting the hands. In some by a square at the back. In others by a square at the centre of the hands, and at times through a hole in the side of the case, or in some instances the square at the centre of the hands is sunk below the level, also by an eccentric hole in minute hand boss, and lastly, in a few exceptional cases, the hands can only be set by means of a pin.

It is not generally known why, when dials are marked in Roman figures, the IV. is put so, IIII., which is incorrect. The "Strand Magazine" for March, 1918, gives an anecdote on the point. Charles V. of France ordered a Turret clock from Henri de Vick, in 1364, supposed to be the first clock of the kind made. When submitted to the King he pointed out the IV. should be marked IIII. De Vick objected, but the King said "I am never wrong." Henceforth the custom prevailed.

#### ESCAPEMENT.

The cylinder escapement was invented by Thomas Tompion, Booth and Houghton, and patented in 1695. The patents eventually ran out and George Graham, who succeeded Tompion, greatly improved this escapement about the year 1725. Graham shewed it to Julien Le Roy in 1728 and he greatly approved it. The cylinder escapement is often known under the name of horizontal escapement, because it is horizontal compared with the verge which it superseded, this being vertical.

Since all the cheaper Swiss watches of to-day are "cylinder," such an escapement is often spoken of simply as "Swiss." Although the "cylinder" is not a free escapement, it is

exceedingly good. The main reason why it did not come into use to a great extent in its early days was due to the fact that the cylinder was made of steel and the escape wheel of bronze. The latter consequently became worn out very soon. Later, the Swiss used a hard steel for the escape wheel which solved the problem. Steel cylinder escape wheels were employed by Breguet and Lepine at the same time and for the first time.

John Arnold, the inventor of the chronometer, first used a ruby cylinder in 1762. Breguet, in all his best watches, employed ruby cylinders and improved the escapement to such an extent that these time-keepers were practically as good as those with the lever escapement. It may be mentioned that Graham was the inventor of the dead beat escapement, also of the mercury bob pendulum, and John Harrison invented the gridiron pendulum. Breguet made use of all these inventions in work which he produced. The lever escapement was invented by Thomas Mudge about the year 1766, and he shewed it to Berthoud, who was not so struck with it as others. Notwithstanding, the lever escapement has survived for all good watches. John Arnold invented the chronometer in 1782, and Thomas Earnshaw invented practically the identical escapement in 1781, but only became known when the patent was taken out in 1783.

The chronometer escapement is called a free escapement, *i.e.*, the balance wheel is free during the greater part of its vibration. This escapement was known long before, but a slightly different principle existed, *viz.*, that instead of the straight gold spring, a spiral spring was used. Such was the Berthoud and the Le Roy chronometer escapements. Although they were excellent, the newer method was simpler.

The original inventor of the chronometer is said to have been Dutertre, a Parisian master watchmaker, somewhere about 1741. Pierre Le Roy presented to the Academy of Science in 1748 an improved form, but Perron de Besançon considered that it was faulty. This was followed by Berthoud's improvement at about the same time as Arnold and Earnshaw perfected the chronometer in England. Breguet made a large number of chronometers upon Arnold's and Earnshaw's plan, and he was appointed watchmaker to the Marine (*i.e.*, Admiralty).

All the inventions made by Breguet are remarkable in regard to one point or another. In fact, he never made two watches alike, with the exception of those known as the "Souscription."

To describe a few of his types in order to give examples, take first the "Tourbillon," invented in 1795, and patented 1801. Here he placed the balance, the lever and escape wheel, or whatever other form of escapement he employed, upon a platform. This platform revolved around a fixed cog-wheel, thus averting any want of poise in the balance and getting rid of position error. The platform, with the escapement complete, can be taken out on removing one screw and a cock. Care must be taken that the watch is stopped when this is done, and if the seconds-hand is placed on the Tourbillon axis it is first removed. The balances in Tourbillon watches usually vibrate very rapidly. In these watches I have always found repeating work and other complications absent, except chronograph work. It would appear that they were intended for accurate timekeeping and for scientific purposes, so unnecessary complications were omitted, though room exists to put in the repeating parts.

In the majority of cases, Breguet dispensed with banking pins, the limiting action being produced by a pin vibrating in a hole, and by a number of other ingenious methods. The engineering in all Breguet's watches is excellent, the fast moving portions being very light compared to those which move slowly, and some of the escapements look extraordinarily fragile, but by reason of their lightness they will wear much longer than if they had been made in a heavier manner.

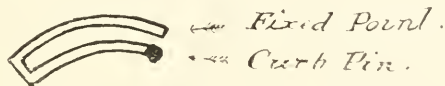
Breguet was very fond of what may be termed the straight line lever escapement, *i.e.*, the pivots of the balance, lever and escape wheel in a straight line. Also he had many forms of resilient escapements. A vast number of methods for constructing the lever were employed. In certain types the lever was made in two pieces of sapphire, which looks very complicated, although simple and accurate in action. In watch No. 160, the one said to have been made for Marie-Antoinette, such a lever exists. I have also seen one in a marine chronometer.

Arnold invented the helical spiral. Breguet improved upon it. What is known as the overcoil of the flat spiral, is Breguet's idea and is known as "Breguet's springing." The earliest

watches of this Master, which were verge, appear not to have been made at his factory, though one made there is known of remarkable workmanship. He also made virgule and duplex escapements, but later, the cylinder, lever and chronometer appeared to be used almost universally. The balance staff jewels, instead of being fixed to the plates or cocks, were carried by delicate springs, and the ends of the staff were cones instead of pivots. Thus, if the watch received a shock the jewelled stones would allow the conical ends to pass and nothing would be broken and all could be put in place again in a moment with the finger.

The balances in all of Breguet's best watches are beautifully made and exceedingly light, with two, three or four radial arms, and the timing screws so placed as to be below the level of the rim. In the watch containing two movements, made for George III., each balance was entirely encircled with a second rim to act apparently as a protection. Holes existed in this ring to enable the timing screws to be reached. Later, the balances were made more in accordance with the type of the present day, but I think this was rather to reduce the cost of the watch than for any other reason.

Breguet had a peculiar method for semi-compensation, not far inferior to complete compensation. A curb pin is carried on a long arm, consisting of two metals soldered together. This arm is bent back upon itself thus:



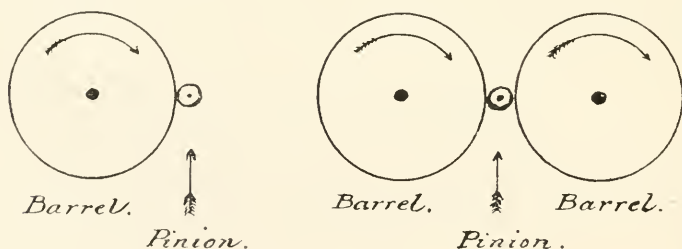
With a change of temperature, the curb pin moves, which alters the manner in which the hair-spring vibrates. In Breguet's miniature watches, of which exceedingly few were made, the certificates state that platinum balances were used, since there was no room for compensated ones, and the expansion and contraction of platinum is very small at ordinary temperatures.

In regard to clocks, Breguet used a variety of escapements, Lepaute's pin wheel, the Graham, and others. One ingenious clock I saw, for use on a mantelpiece, employed two small weights to keep it going.

In the various plates given in this book, a great many of the points described, can be well seen, also others which are referred to further on. The key, known as the "Breguet" or "tipsy," to avoid winding the wrong way, was also a Breguet invention.

#### THE TRAIN.

In many of Breguet's first-class watches, the jewels and other parts are held in place by what may be termed miniature turn buttons. The actual wheel work is the same as found in all watches which are carefully made, but frequently two barrels exist. It might be thought that the two main springs were intended for giving more power or to make the watch go for a longer time. However, this is not the case. On one of Breguet's certificates, for Watch No. 4004, No. 64 Collection, it is stated that the two barrels are not placed for either of these purposes. The object in view is to reduce the friction on the pivots of the pinion engaging with great wheel on the barrel. Extra power can also be obtained if required. In the case of one barrel the pinion is pushed away from it, with considerable force. If a barrel is placed on opposite sides, and made to turn the pinion in the same direction, this pressure on the pivots is eliminated.\* Hence friction is reduced with advantage to the watch. Here is the plan shown diagrammatically :



He had also a kind of escapement which he termed constant force, but it would appear that it was only a form of chronometer escapement and not like the constant force of Berthoud, which acts on the following principle, viz., that the main spring winds up, every half hour, a small spring and it is this which keeps the clock going. In some clocks, Breguet also employed this method.

\*In some marine chronometers Breguet employed four barrels to reduce friction.



There are a vast number of small details in connection with Breguet's work too numerous to be referred to here, since they have an interest rather for the watchmaker than the ordinary reader; in fact, these details run into hundreds, or perhaps thousands. Yet they are worthy of study when a watch is under examination, and the illustrations given will be of some assistance in this respect. It is evident that Breguet was not only a genius in invention and design as well as a great workman, but he had the power to bring around him men as skilled as himself, and their wages were not stinted, since it would appear from the books of the Firm that the head mechanics received as much as 3,000 francs per month.

#### SPECIAL WATCHES.

Under this heading it is impossible to give any complete list or idea as to limit, because Breguet made watch upon watch that differed entirely from the ordinary run, but there are two or three special forms which are celebrated, and I will therefore limit myself to these.

To begin with the watch which he termed "Perpetuelle." This watch has two main springs which are wound by a weight of platinum, or platinum and gold, which moves up and down when worn, and the watch is wound up after its wearer has walked for about fifteen minutes. When fully wound, the weight is locked. On the dial is an indicator which shows for how many hours the watch is wound. The end of each barrel arbor projects beyond the surface and is threaded with a screw. On this, a little wheel or piece is placed capable of being screwed up and down, but, of course, through a very short distance. As the watch winds up, these little wheels move upwards away from the barrel. In the one case, working through levers the hand on the dial is moved shewing the amount wound up, and the other one moves a lever which at the proper moment locks the weight so that it can no longer rise up or down, and thus saving the mainspring from being overwound and broken. Such a watch is made to go for 48, 56 or 60 hours.

Another watch Breguet made has two dials, one showing solar time and the other mean time, also a perpetual calendar. It is a very difficult problem to show solar time in the usual way.

Showing equation of time is quite another thing. Solar time clocks have been made, which are more simple, because there is plenty of room to get the works in, and in one instance the solar time is obtained by lengthening or shortening the pendulum to effect the changes. A solar watch is said to have been made by Thomas Mudge about 1750, but it is doubtful whether it was a true solar watch or one showing the equation of time, for both went under the same name at that period.

In the watch in question, when the dial is removed, the complication necessary to effect the desired end is seen. The inner dome is made of rock crystal so that the movement can be viewed, and the cam which works the solar dial is seen. To alter the hands, it is only necessary to change those on the mean time dial. The solar hands move in sympathy. (See Watch 66.)

Many watches have independent seconds and the wheel which carries the seconds hand is a wonderful piece of work, being as thin as tissue paper, so that if the independent seconds is left running, there is next to no extra work put upon the watch. Also the flirting star is double, so that by shifting them, the points can be made more or less blunt to prevent the possibility of a dead point.

In repeaters, the hours were generally struck on the case, or, as it was termed, "au toc," and the minutes on a gong. Sometimes there was one gong to do the whole repeating and at other times two gongs.

In some watches, the hammer does not directly strike the gong, but hits another little hammer, which does the work; thus the sound is softer.

When the dome of a watch is closed, there is a possibility of dust getting through the winding square. Breguet's method to prevent this was to have a little tube around the square to pass through the dome. In the double movement watch made for Louis XVIII. two little spring pieces press against the dome to meet this end.

It is always possible to distinguish a genuine Breguet or a watch made by one of his pupils by the way in which the screws are placed, since this is done with such care and accuracy. This can even better be seen when the work is compared with other watches, even the best.

Sometimes people say to those who admire Breguet's work, that, being enthusiasts, they look through rosy spectacles. Yet those who have studied clock and watchmaking, and have examined a number of this Master's productions, are amazed with the ingenuity displayed and the wonderful care with which his work was carried out.

It may be conceded that when some 80 or more watches by Breguet can be compared, the generalisation dealt with in this chapter is justifiable, especially since at least half of the number consist of his more important productions.

The expressions "au toc" and "à tact" may be explained.

"Au toc" means when, in a repeater watch, the hammer strikes on the case, producing a dull sound, and not on a gong or bell.

"À tact" applies to "blind men's" watches. A hand or arrow outside the case can be turned round freely in the opposite direction to the hands, but when turned the other way it is felt to stop at the hour shown by the watch. Little knobs around the case, corresponding to the figures on the dial, enable, by the touch, to discern the right time approximately.



## CHAPTER V.

DESCRIPTION OF 87 WATCHES TAKEN FROM THEIR CERTIFICATES  
AND 6 CLOCKS, WITH A FEW ADDITIONAL REMARKS OF INTEREST.

## No. 1.

*Certificate No.* 2404.

*Watch No.* 83.

Sold to Prince of Wales, 22 Ventose, 1805, for 2760 francs.

Gold case, 10 minute repeater, calendar, circular engine-turned back, body edge fluted, gold dial, steel hands, pendant piston, ruby cylinder escapement, ruby holes, elastic suspension. The little collar on pendant turned to right "clicks," then hour can be repeated. On turning collar slowly to left one "click" is felt, then a second. Now the date, and not the hour, is repeated, the tens "au toc" and days beyond on a gong. Turning further to left locks the piston.

N.B.—A similar watch is known which repeats the hour when face is upwards, and repeats the date when face is downwards.

## No. 2.

*Certificate No.* 2511.

*Watch No.* 2980.

Sold to Mr. W. Wenham, June 28th, 1819, for 3760 francs.

Gold case Tourbillon, seconds dial, chronograph seconds, indicator for amount of spring wound, gold dial, small dial for hours, large circle for minutes, steel hands, engine-turned, inner dome gold, fusee, escapement natural lever and compensated balance, ruby holes.



**No. 3.***Certificate No. 2595.**Watch No. 2788.*

Sold to the Prince Regent, October 2nd, 1818, for 7200 francs.

Gold case, engine-turned, inner dome gold engraved with equation of time, silver dial, two dials showing both mean time, one dial with gold hands, central seconds driven by the works, which dial has steel hands, and this seconds hand is steel, anchor escapements, compensated balances, ruby and sapphire holes, elastic suspensions. Two complete works in one case. One balance can be approached or receded from the other. It was believed that two balances vibrating close together would correct the errors in each and beat in unison. Two nibs are present for stopping either balance.

N.B.—A similar watch was made for Louis XVIII. of France, No. 2794. This watch, viz., No. 2788, has certain points of difference from the other one, mainly in the balances which are each completely surrounded by a closed thin hoop, which vibrates with the balance, but pierced with holes to gain access to timing screws.

**No. 4.***Certificate No. 2370.**Watch No. 2794.*

Sold to Louis XVIII. of France, 3rd September, 1821, for 7000 francs.

Red gold case, engine-turned, inner dome gold engraved with solar equation table, silver dial, with two dials showing time, one with steel hands, the other with gold hands and dial for seconds. A central seconds hand in steel, worked by the movement of the dial with steel hands. Anchor escapements, compensated balances, all holes ruby or sapphire, elastic suspensions. Two complete works in one case. The balances are close to one another, and can be approached or receded from one another.

N.B.—The idea was that the errors in one balance would correct those of the other, if vibrating close together. The dial with steel hands was intended to show sidereal time (3m. 56s. slower than mean time daily) and the other dial mean time. At present, both dials show mean time, being so regulated. Two nibs exist, permitting at will to stop either balance.

A similar watch was made for the Prince Regent, No. 2788, with slight differences in works.





## No. 5.

*Certificate No. 2372.**Watch No. 121.*

Sold to Jerome Bonaparte, 11th September, 1806, for 4800 francs.

Gold case minute repeater, central independent seconds, small seconds dial, gold dial, gold hands. Lever escapement, ruby holes, parachutes, compensated balance.

N.B.—Secret signature on dial. Works beautifully made. Inner dome removes by turning, *not by removal*, a screw with a screw-driver, and the dome has a window in it to see escapement, which is remarkable.

## No. 6.

*Certificate No. 2508.**Watch No. 148.*

Sold to Duc de Praslin, December, 1792, for 4000 francs.

Gold case minute repeater, "Perpetuelle," calendar, indicator shewing spring wound, thermometer, silver dial, seconds dial, chronometer escapement, compensated balance, ruby holes.

## No. 7.

*Certificate No. 2494.**Watch No. 119.*

Sold to Brothers Chandoir, 28 Pluvisoie, 1798, for 2400 francs.

Gold case repeater, repeating hours "au toc" and minutes on gong, calendar, plain case, enamel dial, steel hands, steel cylinder escapement, approximate compensation. Nib at side of body to repeat fast or slow. Turn piece near pendant to lock it. Winds up at side of body.

## No. 8.

*Certificate No. 2549.**Watch No. 1256.*

Sold to Mr. Castaneda, 6 Prairial, 1804, for 3000 francs.

Gold case, clock watch and minute repeater, originally engine-turned back, now glass, enamel dial, steel hands, secret signature on dial, edges "fluted," calendar at back and silver back dial. Ruby cylinder escapement, ruby holes, elastic suspensions.

N.B.—The backs in Breguet's watches almost invariably took out like the front glasses. In this watch it would appear the customer requested a calendar to be added, and a glass back. The certificate stated at first there was an inner gold dome.



## No. 9.

*Certificate No.* 2389.*Watch No.* 4099.

Sold to Mr. A. Demidoff for Doctor J. Benois Cros,  
21st October, 1830, for 5200 francs.

Gold case contained in separate outer gold case, both engine-turned, half quarter repeater, letters B.S. on back (which have been removed), silver dial, independent seconds, small seconds dial, calendar, steel hands. Lever escapement, compensated balance, elastic suspension, ruby holes. Beautiful workmanship. A bolt at side on the body locks the independent seconds push piece. Secret signature on dial.

The watch is wound by turning key in opposite direction to usual, as if a fussee was present. This is done by means of an additional wheel with ratchet shaped teeth, turning a similar one fixed to barrel arbor. The axis of winding wheel is pierced. The object in view was either to get the winding place in a more convenient position to wind, or, more probably, to obtain more room for the mainspring, since by this method, the barrel arbor could be made much smaller in diameter.

N.B.—If, by accident, the case is closed with the watch out of it, it may be opened with a needle passed through a little hole near the place for the pendant.

## No. 10.

*Certificate No.* 2477.*Watch No.* 2934.

Sold to unknown person, 8th December, 1817, for 2400 francs.

Gold case, half quarter repeater, engine-turned, gold dome, silver dial, steel hands, secret place in back cover for portrait, ruby cylinder escapement, semi-compensated, ruby holes, parachutes. Secret signature on dial.

## No. 11.

*Certificate No.* 2478.*Watch No.* 4274.

Sold to Mr. Serge Lournozoff, 20th June, 1825, for 1800 francs.

Gold case, silver body, engine-turned, gold dome, silver dial, small seconds dial, steel hands. Lever escapement, compensated balance, ruby holes, "ouvrage 1<sup>ere</sup> classe."



## No. 12.

*Certificate No. 2320.**Watch No. 695.*

Sold to Lucien Bonaparte, 3 Messidor, 1801, for 4000 francs and 5000 francs more for the special case. 9000 francs in all.

Gold blue enamelled watch à tact, savonette, arrow in diamonds for tact. On other side C in diamonds. Small silver dial seen on opening the back. Eleven brilliants for the tacts, with pearls between. Ruby cylinder escapement, ruby holes.

N.B.—It is supposed that the purchaser gave this watch to his sister Caroline, the Queen of Naples.

The brooch with diamond is modern.

## No. 13.

*Certificate No. 2509.**Watch No. 124.*

Sold to Mr. Seguin, 24 Fructidor, 1800, for 3600 francs.

Gold case, engine-turned, fluted body, perpetuelle, minute repeater, silver dial, spring indicator, calendar, small seconds dial, steel hands. Lever, compensated balance, ruby holes, two barrels.

N.B.—At some period the original escapement has been replaced by an English Lever compensated one.

## No. 14.

*Certificate No. 2599.**Watch No. 4579.*

Sold to Mr. de Roos, 7th May, 1829, for 5080 francs.

Gold case, silver body, very flat, engine-turned, silver dial, gold hands, calendar, à tact. Back turus to expose winding hole, pierced barrel. Lever escapement, compensated balance.

## No. 15.

*Certificate No. 2591.**Watch No. 2569.*

Sold to Mr. N. (handed to Mr. Moreau) 1812, for 1700 francs.

Plain gold case, Tourbillon, enamelled dial with secret signature, steel hands, small seconds dial. Lever escapement, compensated balance, ruby holes.

N.B.—The original back has been replaced by a similar one. Very fine works.



**No. 16.***Certificate No.* 2424.*Watch No.* 1806.

Sold to the Princesse Murat, 25th May, 1807, for 4000 francs.

Gold case, quarter repeater, secret place for portrait in back, engine-turned, body fluted, calendar, seconds dial, gold dial, steel hands, thermometer, ruby cylinder, ruby holes, parachutes, secret signature on dial.

**No. 17.***Certificate No.* 2536.*Watch No.* 2623.

Sold to Prince Antoine, 1st May, 1814, for 1600 francs.

Gold case, quarter repeater, engine-turned, silver dial, steel hands, gold dome, ruby cylinder, ruby holes, parachutes, compensated balance. Phases of the Moon.

**No. 18.***Certificate No.* 2390.*Watch No.* 2461.

Sold to Prince of Spain, 12th October, 1811, for 3000 francs.

Gold case, engine-turned, back turns to expose winding square, half quarter repeater, silver dial, steel hands, small hour dial, minutes shown on outside circle, regulator on dial, also days of month. Barrel arbor pierced, ruby cylinder, ruby holes, parachutes.

**No. 19.***Certificate No.* 2441.*Watch No.* 4105.

Sold to Baron Schlicker, 4th November, 1812, for 3500 francs.

Gold case, half quarter repeater, engine-turned, silver dial, small seconds dial, extra dial on the face, hand set by a pin or otherwise for keeping engagements, quite disconnected from the works, gold dome. Lever escapement, compensated balance, ruby holes.

N.B.—To open inner dome, the front must be opened, then a press piece is seen near pendant; this must be pressed to open the inner cover at back. At one time the front opened in same way from the back, but this arrangement is now absent.





**No. 20.***Certificate No.* 2587.*Watch No.* 3496.

Sold to Lord Gower, 8th June, 1820, for 2000 francs.

Gold case, engine-turned, à tact, enamelled ring with figures for tact. Back pierced shewing small silver dial with minute hand only. Setting this, sets hours as well. May be turned backwards or forwards without doing any injury. Ruby cylinder, ruby holes.

**No. 21.***Certificate No.* 2514.*Watch No.* 3012.

Sold to Mr. Blandford, 20th July, 1818, for 2000 francs.

Gold case, engine-turned, silver dial, steel hands, small seconds dial near figure VII., regulator on dial. Back turns to uncover winding squares, two barrels, pierced barrel arbors. Lever escapement, compensated balance, ruby holes.

**No. 22.***Certificate (notice) No.* 1281.*Watch No.* 4850.

Sold to M. Anatole de Demidoff, 4th September, 1830, for 8800 francs.

Gold case, in gold savonette case, engine-turned, arms enamelled grey one side, and coronet with monogram engraved on other side. Grey enamelled arms on inside case. Independent seconds, half quarter repeater, calendar, silver dial, small seconds dial, all settings made outside the case, pierced barrel arbor. Can be repeated when in outer case or out of it. This watch is of the very first quality throughout. Lever escapement, compensated balance, ruby holes and parachutes.

N.B.—If, by accident, the case is closed and the watch not in it, the case can be opened by means of a needle through a small hole close to pendant place. It will also be observed that the independent seconds hand moves in opposite way to usual, namely, Right to Left.

**No. 23.***Certificate No.* 1933.*Watch No.* 51.

Sold to Mr. Pym (an Englishman), 12th June, 1792, for 1806 francs.

Gold case, engine-turned, silver dial, steel hands, 10-minute repeater, calendar, ruby cylinder, ruby holes.



N.B.—When days of month reach limit, set afresh by hand. There is a secret arrangement for the repeating. When front is opened, the dial (with the works) can be turned a little to the left. Then repeating can be done; when the XII. is turned to come under pendant, the repeating piston is locked.

**No. 24.***Certificate No. 2506.**Watch No. 4051.*

Sold to Lord Saint Asaph, 27th June, 1828, for 1640 francs.

Gold case, silver body, engine-turned, à tact, enamel dial, one hand only of steel, ruby cylinder, ruby holes, parachutes, compensated. Secret signature on dial.

**No. 25.***Certificate No. 2534.**Watch No. 4020.*

Sold to Baron de Mecklenbourg, 15th May, 1824, for 2640 francs.

Gold case, very flat, engine-turned, back turns to uncover winding hole, pierced barrel arbor, silver dial, phases of the Moon, small seconds dial, regulator on dial, gold hands, steel seconds hand. Lever escapement, compensated balance, ruby holes, parachutes.

N.B.—Seconds hand travels round once in two minutes, and seconds divisions engraved on half the circle.

**No. 26.***Certificate No. 2455.**Watch No. 6.*

Sold to Mr. Rougemont, Brumaire, 1797, for 1200 francs.

Gold case, dials both sides, calendar, seconds dial, enamelled dials, steel hands, one side shows mean time, the reverse decimal time, virgule escapement, ruby holes.

N.B.—Supposed to be the only watch so made. Hands on both sides are set from winding side at centre. Hands advance on turning key the "wrong way." One square is for winding, and one sets calendar on mean time dial. Calendar on "decimal" side is set by opening front, and on edge of the body near pendant is a little slide, which when pushed towards the pendant the hand can be shifted with a pin or otherwise, *Right to Left* only. When the slide is pushed *away* from pendant, it causes the hand to jump to zero. Hence if the setting has been pushed too far, the hand must be returned to zero, and setting re-started.



NOTE.—The Revolution altered mean time to decimal divisions in 1792. The first day of the year, viz., January 1st, was not constant, *i.e.*, it commenced on various dates according to our present reckoning. For the year 1804 it was as follows, and it will be seen that the names of the months were changed :—

Vendemiaire (vintage)—Sept. 23 to Oct. 22.  
 Brumaire (foggy)—Oct. 23 to Nov. 22.  
 Frimaire (sleety)—Nov. 23 to Dec. 21.  
 Nivose (snowy)—Dec. 22 to Jan. 21.  
 Pluviose (rainy)—Jan. 22 to Feb. 20.  
 Ventose (windy)—Feb. 21 to March 21.  
 Germinal (budding)—March 22 to April 21.  
 Floreal (flowery)—April 22 to May 20.  
 Prairial (pasture)—May 21 to June 20.  
 Messidor (harvest)—June 21 to July 19.  
 Thermidor (hot)—July 20 to August 19.  
 Fructidor (fruit)—August 20 to Sept. 18.

Each month was divided into three periods of ten. The day into twice ten hours, the hours into 100 minutes, and the minutes into 100 seconds. To make the year correct with the solar year of 365 days, at the end of September, *i.e.*, Fructidor, five days were added, called—

- 1.—Primidi, dedicated to Virtue.
- 2.—Duodi, dedicated to Genius.
- 3.—Tridi, dedicated to Labour.
- 4.—Quartidi, dedicated to Opinion.
- 5.—Quintidi, dedicated to Rewards.

In Leap Year another day was added—Sept. 22 or 23—called Sextidi and styled “Jour de la Révolution.” When Napoleon became Emperor, the usual mode of reckoning was decreed in 1806. Very few watches were made with this “Revolutionary” time, and it is stated no clocks are known to-day of the kind, for the dial only required to be changed. Probably those so made were altered to show mean time again. There, however, exist two interesting clocks by Breguet, showing both times and a perpetual decimal calendar, which is very complicated to construct.



**No. 27.***Certificate No. 2495.**Watch No. 2544.*

Sold to Mr. Havas, 17th March, 1812, for 4800 francs.

Gold case, engine-turned, very thin watch, quarter repeater, silver dial, steel hands, small dial for hours, large dial for minutes. Lever escapement, compensated balance, ruby holes, parachutes.

**No. 28.***Certificate No. 2545.**Watch No. 3518.*

Sold to General de Yermoloff, 29th Septemb̄r, 1820, for 3000 francs and 120 francs extra for gold dial, now absent.

Gold savonette case, engine-turned, half-quarter repeater, silver dial, steel hands, seconds dial near VIII.—IX., crystal glass pierced to set hands, gold dome, number on the watch is 600, but on case correct number 3518. Ruby cylinder, ruby holes, parachutes, "ouvrage 1<sup>ere</sup> classe."

N.B.—Certificate states silver dial given with the watch. This has been put on and the gold one lost.

**No. 29.***Certificate No. 2498.**Watch No. 3066.*

Sold to Duc de Frias, 18th June, 1818, for 2700 francs.

Gold case, engine-turned, silver dial, steel hands, phases of the Moon, quarter repeater, ruby cylinder, ruby holes, parachutes. Two crystal glasses over dial, inner one pierced to set hands. A.F. engraved on back.

**No. 30.***Certificate No. 2588.**Watch No. 4238.*

Sold to Mr. Spies, 16th March, 1826, for 5200 francs.

Gold case, silver body, engine-turned, half quarter repeater, gold dome, secret place for portrait, opened by inserting end of key or a pin in the hole in the back which receives closing nib. Silver dial, gold hands, seconds dial and steel hand, calendar. First-class workmanship. Lever escapement, compensated balance, ruby holes, parachutes.





**No. 31.***Certificate No.* 2371.*Watch No.* 4375.

Sold to Lord Berwick, Stli June, 1829, for 3000 francs.

Gold savonette case, engine-turned, silver body, silver dial, gold hands, regulator on dial. Back turns to expose winding square. Barrel arbor pierced. Lever escapement, compensated balance, ruby holes.

**No. 32.***Certificate No.* 2503.*Watch No.* 3647.

Sold to Mr. Henry Broadwood, 27th October, 1820, for 1800 francs.

Gold case, engine-turned, à tact, savonette, small silver dial, gold ring of hours for tact, steel hands, ruby cylinder, ruby holes.

**No. 33.***Certificate No.* 2473.*Watch No.* 987.

Sold to a Russian Prince, 22 Vendemaire, 1803, for 1440 francs.

Gold case, engine-turned, à tact. On tact side enamelled ring of hours. Other side a window with small silver dial and steel hands. Dial silver. Ruby cylinder, ruby holes.

**No. 34.***Certificate (Notice) No.* 1311.*Watch No.* 4578.

Sold to Comte Maluszewiz, 23rd September, 1831, for 115 livres sterling.

Gold case, engine-turned, back turns to uncover winding hole. Barrel arbor pierced. Silver dial, gold hands. Day of month. Lever escapement, compensated balance, ruby holes, parachutes.

**No. 35.***Certificate No.* 2533.*Watch No.* 3519.

Sold to General Davidoff, 25th February, 1822, for 4500 francs.

Gold case, silver body, engine-turned, arms on back, silver dial, steel hands, half-quarter repeater and calendar, "Montre 1<sup>ere</sup> Classe," seconds dial, ruby cylinder, ruby holes, parachutes. Secret place for portrait in back.



**No. 36.***Certificate No. 2454.**Watch No. 3917.*

Sold to Mr. Thomiin, 11th November, 1823, for 5300 francs.

Gold case, silver body, coronet on back, engine-turned, silver dial, gold hands, seconds dial, steel hand, half quarter repeater and calendar, phases of the Moon. Lever escapement, compensated balance, ruby holes, back pierced for winding, barrel arbor pierced, secret signature on dial. Glass over works at back pierced for winding, back hinged.

**No. 37.***Certificate (Notice) No. 1319.**Watch No. 4993.*

Sold to Comte A. Demidoff, 24th September, 1831, for 2400 francs.

Gold case, engine-turned, enamel dial with secret signature, steel hands, hour shown on a small dial, minutes on another small dial. The seconds hand travels round the large dial and inks a spot at will. Ink put in pen-hand first. The piston at pendant is pulled out and turned. Then when pressed a spot is marked on dial. After using, the ink is cleaned off dial in any convenient way. Back pierced for winding, pierced barrel arbor, ruby cylinder, ruby holes. Slide, on edge, opposite to pendant to stop and start watch.

**No. 38.***Certificate (Notice) No. 1318.**Watch No. 4600.*

Sold to Comte A. de Demidoff, 4th September, 1831, for 10,000 francs.

Gold savonette case, watch removes entirely from case, engine-turned, all adjustments done without opening the watch case, à tact, half quarter repeater, calendar. When in outer case cannot repeat, tact then only used. Silver dial, gold hands, back pierced for winding, barrel arbor pierced. Lever escapement, compensated balance, ruby holes, parachutes.

The watch is very small and beautifully made. The Certificate states work of "1<sup>re</sup> classe," and better could not be made. On front, arms in grey enamel, also coronet and cypher at centre of tact.

N B.—If case is accidentally closed with watch out, it can be opened by pressing a needle through the small hole near pendant place.



**No. 39.***Certificate lost.**Watch No. 1088.*

Sold to Mr. Sammariva, 18 Nivose, 1803, for 7800 francs.

Gold enamelled blue case à tact, pearls around, large rose diamond at pendant, diamond arrow, on other side "S" in diamonds, silver dial, steel hands, gold dome, ruby cylinder, ruby holes.

N.B.—Case wrongly described on Breguet's books, though watch is exactly as issued.

**No. 40.***Certificate No. 2467.**Watch No. 4905.*

Sold to unknown, but date of watch given 1829, and price 2000 to 2200 francs.

Gold case, engine-turned, back turns to uncover winding hole, barrel arbor pierced, silver dial, gold hands. Upon opening glass front, a crystal covers the dial, pierced to set hands. Lever escapement, compensated balance, ruby holes.

**No. 41.***Certificate No. 2548.**Watch No. 852.*

Sold to Lucien Bonaparte, 3 Messidor, 1801, for 4000 francs and extra for diamonds 5000 francs, total 9000 francs.

Gold blue enamelled case, rose point, diamonds around, à tact, diamond arrow and diamond monogram J.J.É. on other side, pendant of small diamonds, silver dial, steel hands, ruby cylinder, ruby holes.

N.B.—Details on Certificate not correctly given. Number on case effaced when monogram was riveted on.

**No. 42.***Certificate No. 2502.**Watch No. 3601.*

Sold to Lord Stewart, 10th June, 1823, for 2400 francs.

Gold case, silver body, engine-turned, quarter repeater, silver dial, steel hands, ruby cylinder, ruby holes, parachutes.



**No. 43.***Certificate No. 2486.**Watch No. 4321.*

Sold to Duke of York, 7th November, 1825, for £200.

Gold savonette case, engine-turned, very small watch. The watch removes from case, silver dial, gold hands, regulator on dial, dates of month. Lever escapement, compensated balance, ruby holes, crystal glass pierced for setting hands, back pierced for winding, barrel arbor pierced, workmanship best quality.

N.B.—If case is accidentally closed with watch out of it, the case can be opened by pushing a needle through small hole by the pendant place.

**No. 44.***Certificate No. 2439.**Watch No. 4627.*

Sold to Prince de Lieven, 14th June, 1830, for 4800 francs.

Gold case, engine-turned, silver dial, gold hands, seconds dial, steel hand, regulator on dial, very thin watch, half quarter repeater, barrel arbor pierced. The little slide by pendant near XI. is to open the hole for winding. Lever escapement, compensated balance, ruby holes.

**No. 45.***Certificate No. 2497.**Watch No. 2187.*

Sold by Mr. Recordon, of London, 21st December, 1811, for 3600 francs.

Gold case, engine-turned, body fluted, silver dial, steel hands, seconds dial, half quarter repeater. Lever escapement, compensated balance, ruby holes, parachutes.

**No. 46.***Certificate No. 2453.**Watch No. 2616.*

Sold to Queen of Naples, 5th July, 1813, for 3500 francs.

Gold grey enamelled case, à tact, very small watch, silver dial, gold hands, thermometer, gold dome, blue enamelled gold chain. Lever escapement, compensated balance, ruby holes. States on Certificate remarkable workmanship in so small a volume and perfection of work.





**No. 47.***Certificate No. 2310.**Watch No. 3542.*

Sold to Duke of Marlborough, 21st November, 1820, for 2400 francs.

Gold case, engine-turned, with coronet and monogram engraved on back, the back turns to expose winding hole, barrel arbor pierced, silver dial, gold hands, regulator on dial, two secret signatures on dial, first-class workmanship, very thin watch. Lever escapement, compensated balance, ruby holes.

**No. 48.***Certificate No. 2555.**Watch No. 4214.*

Sold to Earl of Yarmouth, 20th June, 1827, for 7800 francs.

Gold case, silver body, map of France enamelled on back, silver dial, gold hands, seconds dial and steel hand, calendar, half-quarter repeater, very small thin watch, shews equation of time, amount watch is wound up. Lever escapement, compensated balance, ruby holes, parachutes, first-class work.

N.B.—This watch was constantly worn by the late Sir Richard Wallace.

**No. 49.***Certificate No. 2567.**Watch No. 5047.*

Sold to Mr. Maltsoff, 15th July, 1833, for 1400 francs.

Gold case, engine-turned, cross swords engraved on back, a slide on the edge of body to open hole to wind, barrel arbor pierced, small flat watch, silver dial, gold hands, regulator on dial, ruby cylinder, ruby holes.

**No. 50.***Certificate No. 2347.**Watch No. 2070.*

Sold to Princess Murat, 1st December, 1807, for 2800 francs.

Gold grey enamelled savonette, map of Wurtemberg on back, a tact, very small pearls around, body fluted, silver dial, steel hands, gold dome, secret place for portrait inside, letter "C" and crown on tact side, ruby cylinder, ruby holes.

N.B.—This watch was given by the Grand Duchess Bery, Caroline Murat, to her sister-in-law, Catherine of Wurtemberg, Queen of Westphalia. The map on the watch was intended to remind her of her country of origin. The "C" on the watch



stands for Caroline. She was married to Jerome Bonaparte, August 22nd, 1807, and in view of the date when the watch was bought, it may be concluded that it was for a New Year's present for January, 1808.

**No. 51.***Certificate No. 2594.**Watch No. 1200.*

Sold to Madame X., 11 Thermidor, 1805, for 1500 francs.

Gold savonette case, engine-turned, à tact, gold dial, gold hands, ruby cylinder, not compensated, ruby holes, very small watch.

N.B.—This watch returned to Breguet's firm four times for repairs and cleaning in 1839, 1840, 1843 and 1853.

**No. 52.***Certificate No. 2516.**Watch No. 2912.*

Sold to Mlle. Dumergue, 11th November, 1818, for 2800 francs.

Gold case, engine-turned, silver dial with two secret signatures, gold hands, seconds dial and steel hand, quarter repeater. Lever escapement, compensated balance, ruby holes.

N.B.—This watch was returned to the Breguet Firm about twelve times, between 1843 and 1873, for cleaning and repairs.

**No. 53.***Certificate No. 2577.**Watch No. 1052.*

Sold to Duc de Praslin, 20 Germinal, 1796, for 1800 francs.

Gold grey enamelled savonette case, body fluted, à tact, pearls around and on pendant, letter " B " on back, enamelled silver dial, gold dome, steel hands, ruby cylinder, parachutes.

**No. 54.***Certificate No. 2550.**Watch No. 5038 (on leather case).*

Sold to Mr. X., 16th October, 1835, for 3000 francs.

Very small gold case, engine-turned, silver dial, steel hands, pendant winder, regulator on edge of body. Lever escapement, platinum balance, ruby holes.

N.B.—A miniature watch, beautifully made. Had at one time a savonette case, which has been lost. To set hands, a slide on edge near the VI. uncovers a square for setting. The little brooch is modern.



**No. 55.***Certificate No. 2456.**Watch No. 5019.*

Sold to Comte Meristar Potoki, 29th March, 1833, for 3000 francs and a ring for the watch 800 francs. This has been lost.

Gold case, engine-turned, gold dial, gold hands, pendant winder, regulator on edge of body. Lever escapement, platinum balance, ruby holes. The Certificate adds the work is the best possible that can be accomplished.

N.B.—The little head above the winding head is pulled out, then winding knob can set hands, then the little head is pushed back again. The little brooch is modern.

**No. 56.***Certificate (Notice). No number. Dated 24th October, 1887.**Watch No. 160.*

Watch known as the "Marie-Antoinette," the chef-d'oeuvre of Breguet. It was finished about 1802, and kept by Breguet's Firm. When the last of the Breguets in the business died, the watch passed to the widow, Madame Breguet. She sold it for £600 in 1887 to Sir Spencer Brunton. The watch remained with him till he died, and then passed to his brother, and eventually came into the present Collection.

The "Notice" states that the watch was ordered in 1783 by an officer in the Marie-Antoinette Guards, with the condition that every complication then known or possible should be put in it, no brass used but gold instead, no limit of time to complete, no limit as to price. The watch was commenced in 1783 and completed in 1802, but during the Revolution the work was stopped from 1789 to 1795. The factory costs were 30,000 francs. The condition as to gold works was rigorously carried out. Breguet stated that this watch was to be a monument of horology at the end of the 18th century, and so it came to be. There is no outer case. Probably a very fine one would have been made if the Queen had lived, and the present crystals would have been replaced by glass or gold to make the watch thinner. Some say that the watch was intended as a present to one of the Queen's favourites, but nothing is definitely known on this matter.

Here is the description of the watch:

Gold body and rock crystals both sides, rock crystal dial, and another one white enamel, one with figures in gold, all works



gold except where steel is necessary. The weight is of platinum. Minute repeater, complete perpetual calendar, equation of time, thermometer, indicator for how much wound up, independent seconds, sapphire jewelled and sapphire rollers throughout without exception.

A "perpetuelle" watch requires no winding. The hour hand jumps from hour to hour, but five minutes before the hour moves half-way. Except from a quarter-to to a quarter-past the hour, the hour hand can be shifted hour to hour without deranging the repeating part. There is a seconds dial, hands of steel. All adjustments are made on the body band. Between VII. and VIII. the square for setting hands. Then comes a nib "Masse" with "A" and "M." This is shifted to lock weight when taking rough exercise. Next comes a small hole. If a pin is inserted here, a spring is pushed, enabling the works to come out of the body, the hinge being at the pendant; care is necessary to pull the piston out first to avoid damage.

Then comes "Balance." The nib here stops or frees the balance. The next slide, "Secondes," actuates the independent seconds. Then comes "Mois." On pushing this slide with end of key or a pin, the date hand flies to zero. The next one, "J De Mois," when pushed to and fro, advances date hand day by day. Lastly, the nib "L" and "V" is to make repeating slow or fast.

When works are opened, a hole exists to adjust the timing screws on balance. Within the seconds dial is the square for setting days of week and month, key turned reverse way to advance hands. Near the VIII. is seen a black dot on end of a spring resting on month wheel, so correct setting can be found this way, but when enamelled dial is on, this cannot be seen. The balance spring is a vertical gold spiral. Lever escapement of a peculiar construction, being in two pieces of sapphire. Balance compensated. Two barrels. The arbors are threaded at upper ends, and carry each a little piece. These latter run up and down the thread, according to the amount the watch is wound. When fully wound, one of the pieces actuates a lever which locks the weight and prevents over-winding. The other one works the needle on front dial, showing how much the watch is wound, indicating in hours. The independent seconds wheel





is thin as paper and exceptionally difficult to make. The star wheel which flirts this round is double, the object of this being to avoid a "set" on the seconds by the point of the star falling on the point of the wheel. The star wheels can then be slightly separated, if necessary, to make equivalent to a blunter point, when the trouble disappears. The check springs for weight have sapphire rollers at ends, also a similar roller on the weight. Such is a general description, and the general instructions, without going into minute details.

**No. 57.***Certificate No. 2427.**Watch No. 92.*

Sold to the Duc de Praslin, 11 Thermidor, 1805, for 4800 francs.

Gold case engraved, glass both sides, enamelled dial, gold hands, independent seconds, minute repeater, by 10 minute strokes au toc and minutes on gong, perpetual calendar, equation of time, and thermometer. Back dial gold, the pattern upon it having been done by hand. On this are seen: phases of the Moon, regulator, "fast and slow" for repeating, the amount the main-spring is wound, also the winding and setting squares. Likewise the "start and stop" for independent seconds. Lever escapement, compensated balance, ruby holes.

N.B.—Certificate states this watch was made about 1783 or 1785, soon after Breguet was an exile during the Revolution, and this, no doubt, accounts for the sale having taken place so late as 1805. The watch is a remarkable piece of work, and not inferior to the one intended for Marie-Antoinette (No. 160).

Certificate calls this watch "a time-keeper." Left lower square to wind, upper left square to set hands. Right lower square to start and stop independent seconds. Right upper square a screw to hold dial in place, this square is larger to avoid an error being made. Nib on body front to stop watch. Calendar is set by a square on front dial.

**No. 58.***Certificate No. 2448.**Watch No. 5075.*

Sold to Prince Jerome Napoleon, 27th October, 1857, for 3500 francs.

Very small gold case, plain, eagle engraved on back, stem winder, enamelled dial, days of the month, regulator on edge of



body. Lever escapement, compensated balance, ruby holes, parachutes.

**No. 59.**

*Certificate No.* 2582.

*Watch No.* 4760.

Sold to Madame Glaiseau, 11th July, 1829, for 1200 francs.

Gold case, silver body, engine-turned, silver dial, gold hands, gold dome, ruby cylinder, ruby holes, parachutes.

**No. 60.**

*Certificate No.* 2598.

*Watch No.* 4863.

Sold to Colonel Boutourlin, 12th September, 1837, for 1800 francs.

Gold half hunter, engine-turned, tact in platinum, but tact arrow not now there, apparently removed and glass put in. Barrel arbor pierced, winds at centre, enamel dial with secret signature, one hand only in steel. This may have been intended to replace tact arrow. Ruby cylinder, ruby holes throughout, not compensated, parachute. Regulator on edge of body. "Ouvrage 1<sup>ère</sup> classe."

**No. 61.**

*Certificate No.* 2120.

*Watch No.* 1187.

Sold to a Russian Firm, 13th April, 1810, for 3000 francs.

Silver case, engine-turned, body fluted, silver dial, steel hands, small central hour circles, minutes on large circle, seconds dial, indicator for amount wound up, Tourbillon. Lever escapement, compensated balance, ruby holes, chronograph seconds, started and stopped by piston at pendant. Before using, the bow must be turned to touch back of case.

**No. 62.**

*Certificate No.* 9483.

*Watch No.* 3872.

Sold to Mr. Mittkoff, 12th February, 1825, for 2500 francs.

Gold case, engine-turned, enamelled dial with secret signature, steel hands, gold dome, quarter repeater. Duplex escapement, parachutes, compensated approximately.

**No. 63.**

*Certificate No.* 2359.

*Watch No.* 3624.

Sold to Mr. Demidoff, 21st June, 1821, for 630 francs.

Silver case, gold bezels and ring, engine-turned, enamel dial with secret signature, steel single hand, type of watch known as



“Souscription,” ruby cylinder, semi-compensation, ruby holes, wind-up at centre, either at back or in front.

Note.—These watches were called “Souscription” because they were subscribed for by clients. The attempt was made to produce a watch at a reasonable price which should really be good. Most of them were in silver cases with gold bezels, and price was 600 francs, but numbers were made in more expensive cases at higher prices.

A very interesting circular was issued by Breguet himself which gives the history of these watches, and by the kindness of Mr. Desoutter, this circular is given unabridged in the Appendix.

#### No. 64.

*Certificate (Notice) No. 802.*

*Watch No. 4004.*

Sold to Comte de Demidoff, 1st September, 1823, for 2400 francs.

Gold case, engine-turned, back turns to uncover two winding holes, two barrels, pierced barrel arbors, silver dial, gold hands, seconds dial, steel hand, regulator on dial. Lever escapement, compensated balance, ruby holes, parachutes.

#### No. 65.

*Certificate No. 2496.*

*Watch No. 179.*

Sold to the Queen (Marie-Antoinette), 4th September, 1792, for 960 francs.

Plain gold savonette case, no glass over dial, quarter repeater, uncompensated. Verge escapement, enamelled dial, steel hands, fusee.

N.B.—This watch the Queen gave to her brother-in-law, the Comte d'Artois, later Charles X., and he wore it till his death.

#### No. 66.

*Certificate No. 2520.*

*Watch No. 4112.*

Sold to Mr. Goding, 1st June, 1829, for 8128 francs.

Gold case, engine-turned, crystal glass, crystal dome to see works, pierced for winding and for setting calendar, half-quarter repeater, silver dial, gold hands, seconds dial steel hand. There are two small dials, with a little gold “sun” over one and a “star” over the other. The dial with the sun gives solar time, the other mean time. To set hands, this is done on mean time dial, the hands on other dial follow. Around the outer circle is



the calendar for the year. Through one little window the "day" of the week is shown, and the other window shows the "year." For Leap Year B appears. To set the calendar, account must be taken of the year. The phases of the Moon are shown on the works. Pierced barrel arbor. Lever escapement, compensated balance, ruby holes. This is a most remarkable and complicated watch. The solar hands are set twice a day by means of two racks under the dial.

N.B.—The sun time and mean time four times a year agree, but not at equal distances apart. At other times the sun may be about 15 minutes slow or fast, but not by regular intervals, so that the problem is very complex. This has been accomplished in a clock, but though such watches have been mentioned, it is very probable that they only showed equation of time, which is a simple matter. The problem here is not that of merely giving "equation of time" on a dial, but the solar time. The back has been re-engine-turned concentrically, as it was originally. The letter B stands for Bissextile, a word originating with the Roman method of estimating Leap Year, where a certain month had the "6th" repeated twice in Leap Year.

#### No. 67.

*Certificate No. 2374.*

*Watch No. 2520.*

Sold to an Englishman, 20th July, 1818, for 2400 francs.

Silver, plain square edge case, silver dial, steel hands, Tourbillon. Chronometer escapement, compensated balance, ruby holes, hours, minutes and seconds shown on separate dials.

#### No. 68.

*Certificate No. 2471.*

*Watch No. 2556.*

Sold to Mr. Moreau, 13th May, 1812, for 1320 francs.

Small gold case, engine-turned in vertical lines, silver dial, steel hands, ruby cylinder, parachutes.

#### No. 69.

*Certificate No. 3260.*

*Watch No. 3260.*

Sold to General Levascheff, 21st July, 1822, for 4800 francs.

Small flat gold savonette, engine-turned, silver body, silver dial, seconds dial, half-quarter repeater, repeating piston on





side near I. "Ouvrage de 1<sup>ere</sup> classe et de la plus grande recherche et de main d'œuvre" Lever escapement, compensated balance. Front glass pierced at centre to set hands.

N.B.—There were two secret signatures on dial, but they have been rubbed off.

#### No. 70.

*Certificate No. 2400.*

*Watch No. 1860.*

Sold to Queen of Spain, 7th of June, 1808, for 4800 francs.

Gold case, engine-turned eccentrically, and blue enamel ring round, monogram A. B. in blue enamel on back, body fluted, clock watch, half-quarter repeater, metal dome, gold dial, steel hands, days of month, thermometer, seconds dial. Mixed lever escapement, semi-compensation, ruby holes.

N.B.—When date hand reaches end, re-set by hand. Striking requires winding every 12 hours.

#### No. 71.

*Certificate No. 2583.*

*Watch No. 1022.*

Sold to Duc de Richelieu, 24th July, 1864, for 5000 francs.

Gold savonette case, watch takes out of case, à tact, platinum tact, engine-turned, pendant winder, enamel dial, gold hands, body fret work, regulator edge of body, crystal glass, workmanship "1<sup>ere</sup> classe," made in Paris. Lever escapement, compensated balance, ruby holes, coronet and monogram engraved on front.

N.B.—If case is closed by accident with watch out of it, it can be opened by pushing a needle in the little hole near the pendant place.

#### No. 72.

*Certificate No. 2592.*

*Watch No. 2890.*

Sold to Mr. Doazan, 11th April, 1817, for 3600 francs.

Gold case, engine-turned, half-quarter repeater, enamelled dial, steel hands, centre seconds, gold dome with equation of time engraved around. Lever escapement, compensated balance, a nib to stop balance. The hands are set by opening front, and on edge of body will be seen the set square near XI. There is an extra dial with figures in blue and spare crystal glass.



**No. 73.***Certificate No.* 2581.*Watch No.* 1670.

Sold to Colonel Cooke, 5th April, 1814, for 4800 francs.

Gold case, engine-turned, silver dial, steel hands, indicator for how much wound, seconds dial, two barrels, thermometer. This is a "perpetuelle" watch of first-class construction. Lever escapement, compensated balance, ruby and sapphire holes. Probably the thinnest "perpetuelle" watch made.

**No. 74.***Certificate No.* 2505.*Watch No.* 4551.

Sold to Mr. de Clapernon, 4th December, 1858, for 2200 francs.

Flat gold case, engine-turned, gold dome, enamelled dial, gold hands, days of month, set by pressing on a pin in pendant. Lever escapement, compensated balance, ruby holes, crystal glass.

**No. 75.***Certificate No.* 2589.*Watch No.* 1990.

Sold to Mr. Hennac for Mr. de Bourrienne, 15th November, 1809, for 576 francs.

Silver body, gold bezels and back, gold ring bow, enamelled dial, single steel hand, secret signature on dial, "Souscription" type of watch, winds at centre on both sides.

N.B.—Original back was probably silver and replaced with present gold one, eccentrically engine-turned.

**No. 76.***Certificate No.* 2566.*Watch No.* 2781.

Sold to Prince Gargarine, August, 1814, for 4800 francs.

Gold case, engine-turned, body fluted, minute repeater, thermometer, seconds dial and amount wound up on enamelled dial with secret signature and steel hands. "Perpetuelle" watch of first-class construction, 2 barrels. V. and L. for *vite* and *lent* for repeating. Very fine specimen in perfect condition. Lever escapement, compensated balance, ruby and sapphire holes and sapphire rollers.



**No. 77.***Certificate No. 2428.**Watch No. 4270.*

Sold to Mr. Suzanne de Brécanté, 9th July, 1825, for 3500 francs.

Gold case, engine-turned, fluted body, silver dial, steel hands, seconds dial, phases of the Moon, clock watch and quarter repeater, metal dome, lever escapement, compensated balance, ruby holes, push-screw to lock piston in pendant.

**No. 78.***Certificate No. 2590.**Watch No. 2642.*

Sold to unknown on approval and 50 francs deposit on 31st December, 1837, for unknown price, probably about 1200 francs.

Gold plain case, body fluted, metal dome, enamelled dial with secret signature, steel hands, half-quarter repeater, ruby cylinder, semi-compensated, ruby holes.

**No. 79.***Certificate No. 2585.**Watch No. 2183.*

Sold to Mlle. de Vienne, 12th June, 1809, for 1080 francs.

Plain gold case, quarter repeater, enamelled dial, steel hands, ruby cylinder, parachutes, compensated.

**No. 80.***Certificate No. 2579.**Watch No. 2176.*

Sold to Mr. Recordon, of London, 8th January, 1810, for 2000 francs.

Plain gold case, quarter repeater, enamelled dial, steel hands, gold dome, ruby cylinder, semi-compensated, ruby holes, parachutes.

**No. 81.***Certificate No. 2434.**Watch No. 2571.*

Sold to Princess de Valencay, 8th May, 1812, for 1600 francs.

Silver case, engine-turned, coronet grey enamel on back, enamel dial with secret signature, seconds dial, steel hands, Tourbillon. Lever escapement, compensated balance, ruby holes.



**No. 82.***Certificate No. 2501.**Watch No. 194.*

Sold to Mr. Canfield, 14th October, 1806, for 6000 francs.

Gold case, engine-turned, tabatière, "perpetuelle" minute repeater, enamelled dial, indicator for amount wound up, steel hands, seconds dial. Lever escapement, compensated balance, two barrels, sapphire holes and sapphire rollers, helical balance spring.

N.B.—In fine condition. Original dial has been replaced a long time ago, probably English.

**No. 83.***Certificate No. 2553.**Watch No. 695.*

Sold to Mr. Tanbu, 14 Nivose, 1802, for 1680 francs.

Gold blue enamelled case, à tact, diamond arrow, diamond pansy on back, gold dome, silver dial, steel hands, ruby cylinder, ruby holes.

N.B.—Watch No. 12 is also No. 695. The Certificate issued with this watch is a copy of Watch 695, No. 12 in Collection; and does not apply to this one. It appears by some error this and the other watch both bear same number, and the Firm of Breguet cannot clear up this matter.

**No. 84.***Certificate No. 2562.**Watch No. 2998.*

Sold to Lord Beauchamp, 29th January, 1819, for 4800 francs.

Very thin small gold watch, silver dial, gold hands, half-quarter repeater, calendar, regulator on dial, seconds dial, back engine-turned, and turns to expose winding hole, barrel arbor pierced. Lever escapement, balance compensated, ruby holes, parachutes.

N.B.—Certificate states "steel hands" and a set of gold ones. The latter are on, the steel ones have been lost.

**No. 85.***No Certificate.**Watch No. 4255.*

Sold to unknown person. Date and price unknown.

Made about 1807, since dial is signed "Breguet" and not "Breguet et Fils." Price about 4000 francs.

Gold engine-turned case, with a plain band on which equation of time is engraved. Centre of back, Arms of a Viscount





enamelled in heraldic colours. Back-turns to expose winding holes, two barrels, one for going part, one for the striking part. Arbors pierced. Dial silver, seconds dial, steel hands. phases of the Moon. Clock-watch and quarter repeater. Lever escapement, balance compensated. Secret signature on dial, between X. and XI., but almost effaced.

N.B.—This watch cannot be traced on Breguet's books, due, perhaps, to alterations made in the watch, not by that firm, or failure at the time to enter it. The cover is stamped 4255 B. Number also on pendant. Every point sought for in a genuine Breguet is present, and the work is first-class.

#### No. 86.

*No Certificate.*

*Watch No. 647.*

Sold to unknown person. Made about 1805. Price about 3500 francs.

Plain gold case, clock-watch and quarter repeater, enamel dial, steel hands. Removable metal cap over works, small lever to hold it in place. Ruby cylinder, semi-compensation. Secret signature on dial. Fine works.

N.B.—Breguet's clock-watches are very complicated, for a complete mechanism exists for clock striking part, and the same for the repeating. In modern watches one mechanism serves for both. When hands are set in the case of clock-watches, the striking must first be put to "silent"; if not, the works will be deranged.

#### No. 87.

*No Certificate.*

*Watch No. 722.*

Sold to a person unknown about 1812 for 25,000 francs (thus stated) with the "Pendule Sympathique," of which it forms part.

Gold engine-turned case, very flat, silver dial, steel hands, phases of the Moon, ruby cylinder, not compensated, ruby holes, parachute. Signed "Breguet."

N.B.—A further description of this watch is to be found under Clock No. 5, "Pendule Sympathique," by Rabi.



## CHAPTER VI.

## BREGUET'S CLOCKS.

DETAILS OF BREGUET'S CLOCKS IN THE COLLECTION, WITH  
NOTES UPON THEM.

## No. 1.

CARRIAGE CLOCK, Empire case, gilt bronze, number has been effaced, date about 1812, eight day going, striking "grande sonnerie" (no "petite sonnerie"), repeating and calendar, date rollers, etc., are turned by key, moon shifted by to and fro movement of key, rectangular gongs, can be put to "silent." Lever escapement, no regulator, balance compensated, silver dial, surround gold, steel hands, ruby holes. Cost about 3000 francs or 3500 francs. Winding holes below the dial.

N.B.—Rarely, if ever, did Breguet pierce his clock dials for the winding holes. By means of one or more accessory wheels the winding square or squares were brought below the dials. An English clock, so arranged, exists, made by Richard Comber in 1788. Breguet's age then would be 41, so it is possible that this system was taken from France, since Breguet was famous before he reached the age named.

## No. 2.

MANTEL CLOCK in oak and pearwood case, partly gilt and partly carved, No. 739, striking and calendar, compensated grid-iron pendulum, Lepaute's pin wheel escapement, ruby holes, enamelled dial, steel hands, verified by Breguet's Firm, August, 1926, as sold to Mr. Lewis Lloyd, December 7th, 1855, for 1800 francs. Winding in front, holes below dial.



## No. 3.

CARRIAGE CLOCK, silver case, No. 2793, silver dial, gold surround, steel hands, door opens back and front, winds in front but glass in door pierced so as to wind and set hands without opening door, both holes below dial. The holes are filled by two gold plugs with gold balls and joined by a gold chain, hanging as a festoon when plugs are in place, repeater but not striking, repeating effect by pulling a little gold chain which passes out over a roller under the case. Alarm is wound up by pulling a little gold chain passing over a roller near top of case near the II. A knob near by sets the hand on the alarm dial, and is free when turned wrong way. In place of handle are four silver chains. The top is rounded. At top is a block of steel with a depression intended to receive a bolt to keep clock in place in a carriage. The clock required winding every three days. In May, 1920, the barrel was replaced and extra wheel added that it might go eight days. Nothing has been done to the clock to alter its value. Calendar: the rollers are turned with the finger inside case, opening the back door for the purpose. The year roller must be re-engraved or changed every twelve years. Lever escapement, compensated balance, ruby holes. This clock has been certified by Breguet's Firm, August, 1920, as sold to the Grande Duchesse de Toscane, August 26th, 1813, for 4000 francs. An error appears on Breguet's books. Case is described as gold, which is unlikely for the price. Moreover, the case appears just as issued and similar to a few others made at that time. The mistake is due to a confusion as to gold chains and gold surround of dial.

## No. 4.

CARRIAGE CLOCK, No. 3135, verified by Breguet's Firm, August, 1920, as being sold to Fernand Munez, Spanish Ambassador, 13th November, 1819, for 5000 francs. Case bronze gilt, Empire, very finely modelled, also the works beautifully made, striking "grande" and "petite sonnerie," calendar rollers turned with a pin (care not to scratch), alarm, square to set this on dial at right-hand side, alarm wound by pulling a knob attached to a cord on top of case at right side (gilt), the other knob (black)



on top is for repeating, all settings on dial, the dial silver, gold surround, only one barrel for all movements, striking works at back, goes fourteen days. If calendar changes at noon put striking to silent and turn hands twelve hours. Lever escapement, compensated balance.

### No. 5.

“PENDULE SYMPATHIQUE” Synchronising clock with watch holder on top of case to take the watch which forms part of the combination. The clock not only puts the watch hands to correct time, but also winds it up.

The mechanism is very complicated. The watch holder is upon a hinge, thus it can lie flat upon the top of the clock. The watch can then be put in it and fits accurately. The holder with the watch is now moved to the vertical, when a spring keeps the holder fixed.

On the top of the clock are two nibs, and these just touch two special places on the watch. The nibs move up and down, pump-action, pushing in pins in watch, these pins being pressed outwards by springs. Thus one nib, the right-hand one, looking at the face, in pumping winds the watch twice an hour. The other, once every hour, at the half hours, gives a push, setting the hands to the time of the clock, the latter becoming a standard. The Synchronising is done within 7 minutes fast or slow. Consequently, since a good watch does not vary appreciably during the time it is worn during a day, it is not only put to time but is also kept wound, if the possessor places it on the clock each evening. The end of the main spring in the watch is not hooked, but holds by friction. Consequently, when wound up, there is a slip and overwinding avoided, and the watch may be left on the clock for any length of time without harm being done.

The clock is a large carriage clock, gilt bronze, Empire decoration and chased, silver dial, gold surround, steel hands, goes eight days, striking one gong, does not repeat, calendar and alarm with bell, seconds dial, and indicator to show how much wound up. At back is a dial upon the works marked twelve hours black for night and twelve hours red for day, with an indicator, to be used in getting the proper noon and midnight on the dial. Chronometer escapement, balance compensated,





parachutes, holes jewelled. The watch is signed "Breguet" and clock is signed "Rabi à Paris." The clock is a "Force Constante," that is, a small mainspring is wound half-hourly by the large mainspring, so as not to put undue strain on the escapement. The original cost of the clock is said to have been 25,000 francs, and it was made about 1812.

On the top, at the back, is a black button. This being pulled, winds up the alarum by the cord. The hand of the alarum is set by the square at the left lower part of the dial.

The date is set thus: The long rollers are turned with the fingers and the date roller is turned with a pin. Little holes drilled above the numbers enable this to be done.

To place the watch in the holder, the button in front of the holder is pressed, then it can be hinged back flat on the top of the clock. A nib will be seen at the top, inside of holder; the watch at XII. on the edge has a recess to take this nib. This being effected, the watch fits in case nicely. Now lift the holder to the vertical, when the spring snaps and holds it in place. If the watch is allowed to run down it can be partially wound by means of a pin or thin piece of stiff wire, employing a pumping action on the pin on right-hand side of V.; a few "pumps" starts the watch, then put hands near to right time and place the watch on the clock, when the winding and setting to time will be done automatically.

Since the escapement is a chronometer, with a helical spring, the timing screws must be used to regulate. To effect this, the top of the case must be removed. To do this, the four balls on the top must be unscrewed, first having removed the watch, and the holder turned down. Next the black button is pulled, winding up the alarum. The top can now be taken off, but must not be put flat on a table or the working parts under holder will be damaged. This part must be kept from touching anything. After replacing the top, the alarum, discharged in the usual way, draws the cord into the clock again. The indicator, shows the mainspring wound.

The watch is gold, engine-turned, front opens to set hands. The back is snapped on. Silver eccentric dial, steel hands, phases of the Moon. Escapement, ruby cylinder, ruby holes, parachute, not compensated. Number on case of watch 722 and the B



showing it was made at Breguet's factory. The automatic mechanism for winding is seen when back is off, and a square exists to wind by means of a key if necessary.

These "sympathique" clocks are very rare, and no two were made alike. King George V. possesses one which belonged to George III. Case of clock is plain, balance on bottom of case with tall spiral gold balance spring. This clock only puts the watch right and does not wind it. One existed in the Napier Collection, but with pendulum in place of a balance. There was one in the Demidoff Collection.

It is stated that one was sold to the French Foreign Minister for 35,000 francs, also two to the Russian Court at 8,000 francs and 14,000 francs respectively in Breguet's time. The date of sale of these three clocks would be somewhere about 1812.

Rabi (sometimes spelt Raby), whose signature is on the clock, was one of Breguet's pupils and later one of his best workmen. He started on his own account later, and opened a shop on the Paris Boulevards. His shop existed in 1850, but now it has disappeared. The great attraction in his window was a "Pendule Sympathique," known to all Paris. Rabi wrote a short "Notice" on Breguet.

#### No. 6.

*Certificate No.* 2468.

*Ocular No.* 3165.

Sold to Mr. Smith, 14th November, 1820, for 2580 francs.

An eye-piece or ocular, to be attached to a telescope or field-glass to measure time of transit of a star, etc. Made of brass. Lever, compensated balance, ruby holes, and lever to start and stop the works, two barrels. A wheel with six spokes, each one with a round disc at end, revolves. The eye-piece contains "cross-wires" and the discs pass over them in such a manner that  $1/10$ ths of seconds can easily be read and smaller parts of a second by estimation. The clock-watch part gives the hours, minutes and full seconds. It is also a "stop watch."



## CHAPTER VII.

## SOME OTHER TIMEPIECES.

The last few plates shown have a certain interest in connection with the subject under review.

One is of a watch by Mungier, who was a pupil and worker for Breguet, who started later on his own account. The illustrations showing dial and works are interesting, since they follow Breguet's methods so nearly, that had the watch been signed by Breguet, it could have passed for one of his make. Mungier also made "Souscription" Watches.

Then the old "Perpetuelle" made in Vienna, probably about 1750, which goes to prove that neither Breguet nor Recordon were the inventors of the pedometer watch.

After this comes a modern "Perpetuelle" Watch. The works of this watch show an attempt to make a pedometer watch about the year 1919 by Messrs. Le Roy, of Paris. The principle is somewhat different to that employed by Breguet. Only a few were made. This watch goes well, but more delicate than Breguet's method.

Among the curious Clocks made by Breguet, one with two pendulums is spoken of as having been made for George IV., who was very musical. One pendulum for the Clock and the other to act as a metronome for marking the time of music. At the end of each bar a bell was sounded, which could, at will, be silenced, and the seconds dial registered the speed of that pendulum. The period of vibration was altered by lengthening and shortening the chain by which the bob was carried.



## CHAPTER VIII.

THE numbers of the Watches in the Collection in the rising order of their numbers, the dates when sold, the prices and the number in the Collection are here given for easy reference.

N.B.—The date a Watch was sold is no indication of the date when it was made.

No. of Watch.	Date when Sold.	Price in Francs.	No. in Collection.
6	1797	1200	26
51	1792	1806	23
83	1805	2760	1
92	1805	4800	57
119	1798	2400	7
121	1806	4800	5
124	1800	3600	13
148	1792	4000	6
160	1802	15000	56
179	1792	960	65
194	1806	6000	82
647	1805	3500	86
695	1801	9000	12
695	1802	1680	83
722	1812	—	87
852	1801	9000	41
987	1803	1440	33
1022	1864	5000	71
1052	1796	1800	53
1088	1803	7800	39
1187	1810	3000	61
1200	1805	1500	51





## BREGUET

64

No of Watch.	Date when Sold.	Price in Francs.	No. in Collection.
1256	1804	3000	8
1670	1814	4800	73
1806	1807	4000	16
1860	1808	4800	70
1990	1809	576	75
2070	1807	2800	50
2176	1810	2000	80
2183	1809	1080	79
2187	1811	3600	45
2461	1811	3000	18
2520	1818	2400	67
2544	1812	4800	27
2556	1812	1320	68
2569	1812	1700	15
2571	1812	1600	81
2616	1813	3500	46
2623	1814	1600	17
2642	1837	1200	78
2781	1814	4800	76
2788	1818	7200	3
2794	1821	7000	4
2890	1817	3600	72
2912	1818	2800	52
2934	1817	2400	10
2980	1819	3760	2
2998	1819	4800	84
3012	1818	2000	21
3066	1818	2700	29
3260	1822	4800	69
3496	1820	2000	20
3518	1820	3000	28
3519	1822	4500	35
3542	1820	2400	47
3624	1821	630	63
3647	1820	1800	32
3661	1823	2400	42



No. of Watch.	Date when Sold.	Price in Francs.	No. in Collection.
3872	1825	2500	62
3917	1823	5300	36
4004	1823	2400	64
4020	1824	2640	25
4051	1828	1640	24
4099	1830	5200	9
4105	1812	3500	19
4112	1829	8128	66
4214	1827	7800	48
4238	1826	5200	30
4255	1807	4000	85
4270	1825	3500	77
4274	1825	1800	11
4321	1825	£200	43
4375	1829	3000	31
4551	1858	2200	74
4578	1831	£115	34
4579	1829	5080	14
4600	1831	10000	38
4627	1830	4800	44
4760	1829	1200	59
4850	1830	8800	22
4863	1837	1800	60
4905	1829	2200	40
4993	1831	2400	37
5019	1833	3000	55
5038	1835	3000	54
5047	1833	1400	49
5075	1857	3500	58



The numbers of the Collection with Watch Numbers and Dates of Sale, for easy reference.

No. in Collection.	No. of Watch.	Date when Sold.
1	83	1805
2	2980	1819
3	2788	1818
4	2794	1821
5	121	1806
6	148	1792
7	119	1798
8	1256	1804
9	4099	1830
10	2934	1817
11	4274	1825
12	695	1801
13	124	1800
14	4579	1829
15	2569	1812
16	1806	1807
17	2623	1814
18	2461	1811
19	4105	1812
20	3496	1820
21	3012	1818
22	4850	1830
23	51	1792
24	4051	1828
25	4020	1824
26	6	1797
27	2544	1812
28	3518	1820
29	3066	1818
30	4238	1826
31	4375	1829
32	3647	1820
33	987	1803



## BREGUET

67

No. in Collection.	No. of Watch.	Date when Sold.
34	4578	1831
35	3519	1822
36	3917	1823
37	4993	1831
38	4600	1831
39	1088	1803
40	4905	1829
41	852	1801
42	3661	1823
43	4321	1825
44	4627	1830
45	2187	1811
46	2616	1813
47	3542	1820
48	4214	1827
49	5047	1833
50	2070	1807
51	1200	1805
52	2912	1818
53	1052	1796
54	5038	1835
55	5019	1833
56	160	1802
57	92	1805
58	5075	1857
59	4760	1829
60	4863	1837
61	1187	1810
62	3872	1825
63	3624	1821
64	4004	1823
65	179	1792
66	4112	1829
67	2520	1818
68	2556	1812
69	3260	1822





## BREGUET

68

No. in Collection.	No. of Watch.	Date when Sold.
70	1860	1808
71	1022	1864
72	2890	1817
73	1670	1814
74	4551	1858
75	1990	1809
76	2781	1814
77	4270	1825
78	2642	1837
79	2183	1809
80	2176	1810
81	2571	1812
82	194	1806
83	695	1802
84	2998	1819
85	4255	1807
86	647	1805
87	722	1812



APPENDIX.



## NOTE ON BREGUET'S NAME.

Breguet always spelt his name with no accent on either of the "e's," and most forgeries are known by the fact that "Breguet" is spelt upon them "Bréguet," though it occasionally occurs in watches which are genuine that an engraver has made the error to accent the first "e."

Close to the Quai de l'Horloge, where Breguet lived, there is a street named after him, "Rue de Bréguet," with the accent in the name. The Académie Française has decided that this is correct. Consequently, it must be concluded that Breguet did not know how to spell his name, such is the grandmotherly care of the French Government! The question arises: Did Breguet know how to spell his name or not? Here is the trouble of the French language.

For other examples: The French Academy has settled that "automobile" is masculine, that is "un automobile"; the people always say "une automobile," *i.e.*, feminine. The Academy say this is also right, for the word "voiture" feminine is understood, that is "une voiture automobile." Hence this august body blows hot and cold! Again, "Enfant" may be masculine or feminine, according as the child is male or female, but "Bébé" must remain masculine, even when a girl! I could give dozens of such instances. Result: Since Breguet spelt his name as he did, and he was certainly intelligent, I have followed his way of spelling in defiance of the Academy!

## ADDITIONAL NOTE UPON THE BREGUETS.

A little pamphlet or book has been lent to me, which is not to be found in the usual way, called "Les Breguets, par E. Ferret," published about the year 1884. The present book having already been printed, a few points of interest in Ferret's book are added here.

During the years 1790 and 1791 Breguet was a Jacobite and joined the 2nd Battalion of "1<sup>er</sup> Sans-Culotte de la République." Then, seeing the error of his ways, he gave up politics. A letter from his son, then in London, and dated August 21st, 1792, begs his father to give up politics.

After the Revolution, on his return to Paris, Breguet found his factory in ruins. Friends, and amongst them chiefly the Choiseul-Praslin family, helped him to reconstruct his works. It has been mentioned that the Duc de Praslin was a good patron, and in the list of watches it is seen that many were purchased by him. Napoleon was a good patron, and purchased a number of Breguet's watches and clocks, a "Pendule Sympathique" amongst the number.

Louis Breguet (1804—1883), the grandson of Abraham Louis, built the factory, 19 Rue Didot. He gives the dates of several of his grandfather's inventions in a letter dated June 29th, 1832, viz. :

The "Perpetuelle" Watch about 1780.

Tourbillon, 1781.

Improved Repeater Watches, 1787.

Pendule Sympathique, 1793.

Force Constante, 1795.

Louis Breguet was brought up like the son of a Spartan, the father considering this the proper course. He was disinherited by his father, when he died in 1833, but worked to purchase the old establishment.

Louis Breguet came to fame after making for Arago a mirror revolving at 2000 times per second, which was required to measure the speed of light. From that time orders from the great scientists of the day poured in. Amongst the number was Graham Bell, of telephone fame. It is believed that Louis Breguet made the first telephones.

## NOTE UPON BREGUET'S CERTIFICATES.

It would appear that the earliest Certificates were called "Notices," and later on the word "Certificat" was used. There was noted, in all cases the number of the Notice or Certificate, to whom the watch was sold, the date of sale and price. A description of the watch, including the size, weight, number, number of case is also usually given, also any further details as to signature, etc. In the old "Notices" the details for manipulating the watch is usually added, but not in the later ones. At the top of these Certificates, except the very early ones, there is printed an equation of time table. Frequently the Certificate and watch do not agree, due to alterations made in the watch, and sometimes by carelessness on the part of the person who made the entry. This negligence is especially noticeable from 1801 to 1803, in regard to blue enamel savonette à tact watches. These errors are found in the following three Nos. 39, 41 and 83 of the Collection. There is a possible explanation. The movements are correct, but not the cases. Probably the movements, which are all alike, were sent to have the cases made. Later the movements were put in and cross entries made by mistake. Errors also occur in many other Certificates which are clearly oversights.

When a new Certificate for a watch is given the number is a new one, and not the same as the one it had when watch was sold, but the new Certificate states that the contents is the same as the original one.

In the appendix article, "Horlogerie," it is stated certain watches are called "Mixtes" (Art. 13). The watches were made outside, but under Breguet's direction, then finished in his factory. It does not appear that these watches were given Certificates, though they may be regarded as genuine, and in nearly every case they were as good as those entirely made at Breguet's Paris factory. This may account for the reason why some of Breguet's watches have no Certificates.

## BREGUET'S STRAIGHT LINE ESCAPEMENT.

In this type, the projected end of the lever (the counterpoise) is usually split at the end and embraces the escape wheel staff. Thus the staff can act as a "banking pin"; that is, each prong of the fork at end of lever appears to hit the staff alternately.

The principle looks bad at first sight, being likely to wear the staff, also render the pivot holes oval. However, such is not the case. The anchor ends entering the escape wheel are curved, so there is no "draw," and the fork prongs only reach the escape wheel arbor at the "end of the run," hence there is no impact whatever. In modern watches a "draw" is given to the anchor, so this principle could not be applied, for there would be a succession of blows on the escape wheel arbor. This form of escapement can be seen in Clock No. 3, and in some watches.

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 READING THE TIME ON A CLOCK OR WATCH.

In all countries there exists the troublesome process of teaching a child to read the time on a clock or watch. This labour could greatly be simplified. The time shown on a dial, say, "twenty to nine," also called "eight forty," is most confusing, also, it does not give the idea of day or night. We all know the long period required before a child gets over the difficulties. Here is the solution. Employ two dials, one marked for 24 hours, and the hand jumping hour to hour as each one is completed, the second dial starting at "0" and running up to 60, a hand travelling round once an hour, thus the "0" would be marked " $\frac{0}{60}$ " showing it is the end of one count and start of the next. Thus all time would read: the hour, and so many minutes past the hour—for instance, "a quarter to five" would read *at sight* 4 hours 45 minutes. Of course, the hour and minute dial could be made concentric, if desired, as now, but the usual system of the hour hand travelling gradually from figure to figure would not be used. Thus the drudgery a child goes through would be obviated, and a logical system would present itself for all.

Now Breguet evidently saw this point, since in so many of his watches the hour hand jumps hour to hour. In his time the 24-hour day was used only in Observatories.



## "L'AFFAIRE MOINET."

The fact has already been referred to that Breguet intended publishing a book on horology, just before his death. His notes for such a work had been completed. The material in manuscript was confided to one of his employees, named Moinet, to arrange in proper order. Indeed, the work had advanced so far that "printer's directions" existed. Moinet started on his own account after Breguet died, and the firm exists in Paris to-day. In the year 1848 an important work on clocks and watches was published by Moinet, one volume text and one volume plates. It was contended that the volume contained the whole of Breguet's notes, issued under Moinet's name. The Breguet family at that time went to Law with Moinet over the matter. What the result was, I cannot say, even if ever there was a decision, for Moinet died before the case was finished, but the Court ordered the documents to be returned to Breguet's family. However, it was generally recognised that the best part of the work originated with Abraham Louis Breguet.

Lately Mr. George Brown has discovered the original MSS. and the details of the complaints amongst the old documents in the possession of the Breguet Firm.

## NOTE.

The interest to be found in the following reprints of Notices issued by the Firm of Breguet centres in the fact that many of the descriptions apply to the watches dealt with in this book, and many explanations are given.

The line reproductions on pages 95 and 97 have been slightly reduced.

# HORLOGERIE

POUR L'USAGE CIVIL,

CHRONOMÈTRES PORTATIFS,

HORLOGES MARINES ET ASTRONOMIQUES

ET AUTRES INSTRUMENS D'OBSERVATION.

DE BREGUET ET FILS,

HORLOGERS DE LA MARINE ROYALE DE FRANCE.

DE L'IMPRIMERIE DE HUZARD-COURCIER.

(1822 ou 1823)

## Avertissement.

ON nous consulté fréquemment sur les dimensions, les formes et les diverses fonctions accessoires des montres et des chronomètres de notre établissement. Nous en donnons ici une notice, avec la gravure au trait des principales grandeurs, et de plusieurs dispositions de cadrans. Ces figures n'offrent qu'une faible partie des combinaisons que peuvent comporter les montres à l'usage civil ; mais on pourra les multiplier et les varier à volonté, en désignant le diamètre de tel numéro, avec l'épaisseur de tel autre, ou des dimensions intermédiaires, et en adoptant telles fonctions de cadrature, et telles dispositions d'aiguilles, dont plusieurs peuvent être isolées ou réunies. On se composera ainsi facilement, suivant son goût, des montres d'une combinaison neuve et particulière.

L'élégance des formes, le choix et la proportion des filets ou moulures, l'effet de l'arrondi des bords de la boîte et du cristal méplat, la délicatesse du guilloché des cadrans et la légèreté des aiguilles, l'opposition du *mat* au brillant métallique, qui distinguent nos pièces, ne pouvaient être rendus par la gravure au trait et par le dessin géométral, toujours peu flatteurs. Le simple trait exagère toujours à l'œil les proportions ; nous aurions pu les réduire, pour rendre mieux l'effet, mais nous avons préféré des mesures exactes. On y reconnaîtra néanmoins que nos pièces à l'usage civil, mesurées au centre avec le compas d'épaisseur, sont plus plates que celles du commerce, à diamètre égal. Nous n'en exceptons que quelques *chronomètres* destinés plus particulièrement à l'observation, et des montres *perpétuelles* augmentées en ce sens, par la masse qui les remonte, ou par la réunion d'un plus grand nombre d'effets ; nous en exécutons aussi de beaucoup plus plates. Généralement, les axes des mobiles dans toutes nos pièces, sont plus longs proportionnellement, que dans les *mouvements* de construction ordinaire ; cet avantage pour la solidité, résulte de la distribution de nos *calibres*.

Tous nos ouvrages (hors ceux désignés comme de *genre mixte*), nos mouvemens, boîtes, cadrans, ressorts, rubis, etc., sont ébauchés et confectionnés entièrement à Paris. Avec le nom et le numéro d'établissement, nos pièces portent une signature particulière qui ne peut être imitée, et qui les distingue des nombreuses contrefaçons répandues dans le commerce.

La vignette représente une de nos répétitions de première classe à *ressort-timbre*, poussoir à couronne sur le côté, boîte en or et cadran d'argent guillochés, grandeur moyenne. Quoique l'on ait ombré cette figure, elle est encore loin de rendre l'effet agréable de nos montres de ce genre, qui paraissent toujours à la vue et au toucher, d'une proportion plus légère que dans le dessin.

Nous ajouterons, par la suite, les figures de plusieurs autres productions citées dans cette notice, et dont les planches ne sont pas terminées.

## Table des Articles.

## PREMIERE DIVISION, POUR L'USAGE CIVIL.

*Montres à répétition.*

	Explication.	
	N <sup>os</sup> des articles.	N <sup>os</sup> des figures.
Répétition de première classe . . . . .	art. 1 <sup>er</sup>	} vig- nette et n <sup>o</sup> 8.
— de seconde classe . . . . .	art. 2 <sup>e</sup>	
— de troisième classe . . . . .	art. 3 <sup>e</sup>	

*Montres simples.*

Montre simple à une seule aiguille . . . . .	art. 4 <sup>e</sup> . . . n <sup>o</sup> 1.
— à deux aiguilles, avec ou sans quantième, avec ou sans secondes . . . . .	art. 5 <sup>e</sup> . . . n <sup>o</sup> 2.
— moyennes et petites de <i>col</i> pour les dames . . . . .	art. 6 <sup>e</sup> . n <sup>os</sup> 5,9,10

*Montres de fantaisie ou de luxe, sur les principes des  
chronomètres.*

Montre <i>perpetuelle</i> , simple ou à répétition . . . . .	art. 7 <sup>e</sup> . . . n <sup>o</sup> 7.
— à quantième simple, ou annuel, ou bissextile . . . . .	} art. 8 <sup>e</sup> .
— à équation . . . . .	
— avec le temps sidéral . . . . .	
— avec grande aiguille de seconde concentrique, avec ou sans répétition . . . . .	art. 9 <sup>e</sup> . . . n <sup>o</sup> 6.
Répétition très plate avec secondes et balancier com- pensateur . . . . .	art. 10 <sup>e</sup> . . . n <sup>o</sup> 4.
— dite <i>au tact</i> , grand. ordin., moyenne et petite de <i>col</i> . . . . .	art. 11 <sup>e</sup> . n <sup>os</sup> 3, 5, 9, 10.
Montres simples, très plates, de toutes grandeurs, boîtes guillochées, émaillées, gravées, etc. . . . .	art. 12 <sup>e</sup> .
Montres <i>mixtes</i> , simples ou à répétition . . . . .	art. 13 <sup>e</sup> .

*Pendules d'appartement.*

Pendule, simple, avec ou sans figures, cabinet en bronze ou en acajou . . . . .	} art. 14 <sup>e</sup> .
— avec sonnerie ordinaire . . . . .	
— grande sonnerie des quarts . . . . .	
— répétant l'heure avec les quarts, et pièce de silence . . . . .	
— avec tirage de répétition . . . . .	
— à demi-secondes et <i>pendule</i> compensateur . . . . .	
— échappement à ancre . . . . .	
Pendule à échappement libre simple . . . . .	
— à échappement libre à force constante . . . . .	
— à remontoir d'égalité . . . . .	
— à quantième simple . . . . .	} art. 15 <sup>e</sup> .
— à quantième annuel, ou avec quantième bissex- tile et équation . . . . .	
— avec l'âge et les phases de la lune . . . . .	
— à <i>tableau</i> , paysage avec effet de sonnerie lointaine . . . . .	

*Pendules de voyage ou de voiture.*

Pendules de voyage en forme de grosse montre . . . . .	}	art. 16 <sup>e</sup> .
——— forme carré long en hauteur, avec glaces, marchant 8 jours . . . . .		
——— forme de portique, marchant 8 jours . . . . .		
——— à réveil . . . . .		
——— à répétition . . . . .		
——— avec sonnerie ordinaire . . . . .		
——— Grande sonnerie des quarts, répétition de l'heure aux quarts et silence . . . . .		
——— quantième simple . . . . .		
——— grand quantième ou almanach donnant la date d'une lettre . . . . .		
——— équation, âge et phases de la lune . . . . .		
——— échappement à cylindre de rubis, ou libre, et en chronomètre . . . . .		

## DEUXIEME DIVISION, POUR LA MARINE,

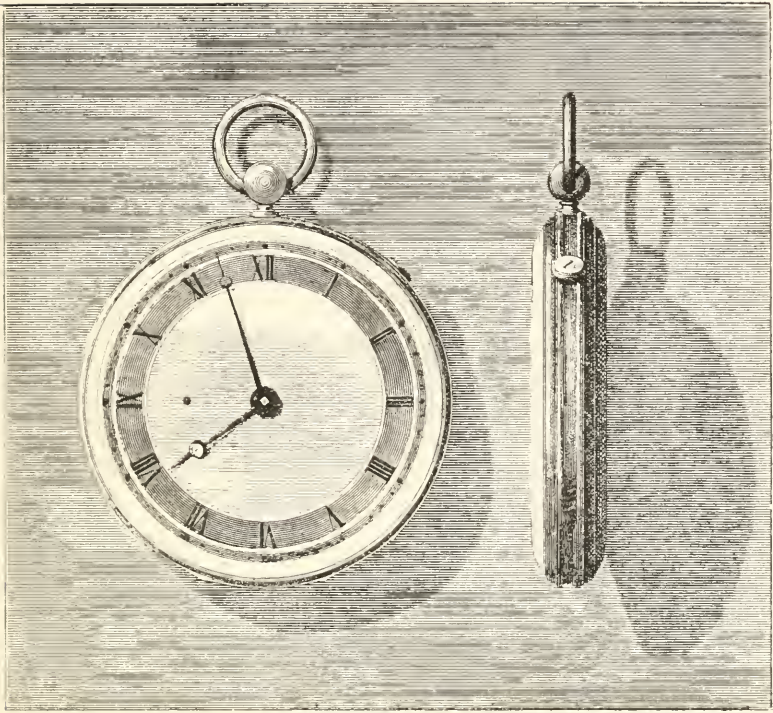
## L'ASTRONOMIE ET LA PHYSIQUE.

Horloges marines, marchant 50 et 60 heures . . . . .	}	art. 17 <sup>e</sup> .
——— marchant 8 jours . . . . .		
——— moyennes et petites marchant 40 heures . . . . .		
Grands chronomètres de poche . . . . .	art. 18 <sup>e</sup> .	n <sup>o</sup> 11
Chronomètres ordinaires . . . . .	art. 19 <sup>e</sup> .	

*Chronomètres de luxe et inventions diverses.*

Chronomètres avec répétition . . . . .	art. 20 <sup>e</sup> .
——— à tourbillon sans répétition . . . . .	art. 21 <sup>e</sup> .
——— à doubles secondes, sans répétition . . . . .	art. 22 <sup>e</sup> .
——— à équation avec temps moyen ou sidéral . . . . .	art. 23 <sup>e</sup> .
——— doubles ou à deux mouvemens . . . . .	art. 24 <sup>e</sup> .
Pendule sympathique qui règle une montre . . . . .	art. 25 <sup>e</sup> .
Compteurs astronomiques à oculaire, pour les lunettes d'observ. . . . .	art. 26 <sup>e</sup> .
Compteurs militaires . . . . .	art. 27 <sup>e</sup> .
Compteurs à pointage . . . . .	art. 28 <sup>e</sup> .
Thermomètres métalliques d'une sensibilité extraordinaire . . . . .	art. 29 <sup>e</sup> .
Grands régulateurs pour les observatoires . . . . .	art. 30 <sup>e</sup> .
Grands régulateurs doubles ou à deux mouvemens et deux <i>pendules compensateurs</i> . . . . .	art. 31 <sup>e</sup> .





## HORLOGERIE.

POUR L'USAGE CIVIL ET POUR LES  
SCIENCES,

DE BREGUET ET FILS,

HORLOGERS DE LA MARINE ROYALE DE FRANCE.

Les productions de notre établissement appartiennent à deux divisions principales :

La première comprend toutes les pièces d'horlogeries pour l'usage civil; et la seconde, les *chronomètres* de tout genre destinés spécialement à l'observation et à la *mesure du temps*.



## PREMIERE DIVISION, POUR L'USAGE CIVIL.

*Montres à répétition.*

Les montres à répétition forment trois classes particulières qui sont le plus en usage.

- 1<sup>er</sup>. La première classe se compose de répétitions avec ou sans *secondes* dont l'échappement est à *cylindre* ou *duplex*, l'un ou l'autre en rubis, avec *compensation au spiral*, et *pare-chute* au balancier. Tous les pivots du rouage ont leurs trous en rubis. Le *calibre* est à *losange*, sur une seule platine. La cuvette intérieure est en or.
- 2<sup>e</sup>. La deuxième classe est formée de répétitions semblables à celles de la première pour le *calibre*; mais il n'y a des rubis qu'à l'échappement. Cuvette en laiton doré.
- 3<sup>e</sup>. La troisième classe est celle des répétitions du *calibre ordinaire*, sur une seule platine, échappement garni en rubis, *pare-chute*, cuvette en laiton doré.

Dans ces trois classes, les cadrans sont ordinairement en émail, et quelquefois aussi en argent guilloché, comme celui de la vignette. Le poussoir est à couronne sur midi, ou sur le côté; les boîtes, de diverses grandeurs, sont toujours en or et guillochées; la moyenne grandeur est celle de la vignette, les plus grandes ont la dimension de la figure n<sup>o</sup> 8; les heures et minutes sont concentriques.

La composition des deux premières classes est la plus parfaite connue, et la cadrature de répétition, tout-à-fait différente de l'ancienne et plus simple, a beaucoup de solidité et peu de hauteur, ce qui permet de réunir, dans ces montres de premier ordre, une forme élégante et riche à l'exactitude et à la solidité de l'ouvrage.

*Montres simples.*

- 4<sup>e</sup>. Montres simples, à une seule aiguille d'heure, déjà très connues sous le nom de *montres de souscription*, échappement à cylindre de rubis, *compensateur* au spiral et *pare-chute*, cadran d'émail, boîtes à collier, en or ou en argent, ou galonnées d'or et argent, unies ou guillochées.

Les figures n<sup>o</sup> 1, *a* et *b*, représentent ces pièces de face et de profil ; elles paraissent moins épaisses et moins grandes à l'usage que dans la gravure au trait. Elles réunissent la solidité et l'économie, et sont recherchées des amateurs de la bonne horlogerie. Elles portent le type des meilleures dispositions de nos autres pièces. Les quarts sont marqués sur le cadran entre chaque heure ; il y a aussi d'autres subdivisions de 5 en 5 minutes : une minute s'apprécie aisément. Le remontoir est au centre du cadran.

- 5<sup>o</sup>. Montres simples avec deux aiguilles concentriques, pour heures et minutes, avec ou sans *secondes*, avec ou sans quantième (\*), boîte en or, cadran d'émail, cylindre en rubis, remontoir excentrique par la cuvette, *compensateur* et *pare-chute*, n<sup>o</sup> 2, *a* et *b*.
- 6<sup>o</sup>. Montres simples, moyennes et petites, dites *de col*, à l'usage des dames, avec ou sans quantième, cylindre de rubis, boîte en or, ou galonnée d'or et argent, guillochée, avec cristal, ou sans cristal et dite à *savonctte*, cadran d'argent, n<sup>os</sup> 5, 9, 10.

Le calibre de ces trois sortes de montres simples, est aussi sur une seule platine, comme presque toutes les pièces mentionnées dans cette notice.

*Nota.* Lorsque les cadrans ne sont pas annoncés *en émail*, ils sont toujours en argent guilloché.

*Montres de fantaisie et de luxe, sur les principes des chronomètres.*

Ces pièces, d'un travail recherché et varié suivant le goût des amateurs, sont de tout genre : simples ou à répétition, à secondes ; avec quantième simple, ou annuel, ou bissextille, *équation*, thermomètre, etc. Telles sont :

- 7<sup>o</sup>. Les montres *perpétuelles*, simples ou à répétition, à demi-quart, ou à 10 minutes, ou même sonnant les minutes, avec

(\*) Nos quantième simples ont, après le 30<sup>e</sup> jour, un zéro sur lequel l'aiguille devient stationnaire ; il faut la remettre en marche en la poussant au premier jour du mois suivant. Ce moyen prévient l'erreur trop facile dans les quantième ordinaires à mouvement continu, que l'on oublie souvent de corriger suivant la différence des mois de 28, 29, 30 et 31 jours. On ne doit pas toucher à l'aiguille du quantième pendant les trois heures qui précèdent ou suivent minuit, parce que c'est l'époque où il se trouve engagé pour son changement propre. Les quantième *annuels* changent d'eux-mêmes suivant la longueur du mois.

ou sans secondes, avec ou sans quantième, ou avec *équation*. Ces pièces n'ont jamais besoin d'être remontées, pourvu que sur deux jours, et, pour quelques-unes, sur trois jours, elles aient été portées en marchant pendant un quart d'heure. Une aiguille dont le centre est sur la 52<sup>e</sup> minute dans la figure 7, marque le développement du ressort, et si la montre a besoin d'être portée. Ces montres, qui ne réussissent que dans notre établissement, sont entièrement fermées pour éviter mieux la poussière, et peuvent marcher six ans avant d'avoir besoin d'un nettoyage ordinaire. La lunette seule peut être ouverte pour toucher aux aiguilles. Cadran d'émail, n<sup>o</sup> 7 *a* et *b*. Il s'en fait de beaucoup plus plates que le profil *b*.

- 8<sup>e</sup>. Les montres, *demi-chronomètres*, à secondes, à quantième simple ou annuel, ou à quantième bissextile et perpétuel, marquant avec les jours du mois ceux de la semaine, les noms des mois avec *l'équation* : celle-ci est indiquée par une aiguille de minutes à part sur un segment de cercle, ou au moyen de deux aiguilles de minutes, concentriques ou excentriques, l'une pour le *temps solaire* ou  *vrai*, mais inégal, l'autre pour le *temps moyen*, égal ou uniforme, ou pour le *temps sidéral*. Les secondes (\*) sont toujours pour le *temps moyen* ou pour le *temps sidéral*. V. l'art. 23.
- 9<sup>e</sup>. Les répétitions avec grande aiguille de secondes concentrique, poussoir sur le côté, arrêt des secondes par le bouton à couronne du pendant, mais seulement après avoir renversé l'ameau sur la cuvette, ou par une simple coulisse sur le collier. Boîte en or, cadran d'argent guilloché, pl. II<sup>e</sup>, n<sup>o</sup> 6.
- 10<sup>e</sup>. Les répétitions très plates, *demi-chronomètres*, échappement libre, balancier compensateur, secondes et quantième, n<sup>o</sup> 4, *a* et *b*. Elles paraissent beaucoup plus plates que dans le dessin. Une coulisse sur le collier remplace le poussoir de

(\*) On ne doit jamais toucher à l'aiguille des secondes. Lorsqu'on remet un chronomètre à l'heure, on se sert du bouton ou de la coulisse d'arrêt des secondes, pour fixer leur aiguille sur 60. On accorde ensuite les aiguilles de minutes et d'heures avec la clef, en les plaçant une ou deux minutes en avance, puis, à l'instant voulu, on fait marcher la montre par le bouton ou la coulisse. Lorsqu'il n'y a point d'arrêt de secondes, on laisse toujours marcher leur aiguille, et l'on accorde avec celle-ci, l'aiguille de minute à vue et au plus près, en tenant compte de la différence qui reste en secondes, à l'égard de l'instrument qui a servi de règle.

répétition. Quantième avec aiguille fixe. Avance et retard sur le cadran, dont la lunette s'ouvre ; mais la boîte ne s'ouvre point pour remonter : le fond tourne, sur lui-même pour découvrir le carré de remontoir, comme pour le refermer. L'aiguille des heures saute d'heure en heure. Cadran d'argent excentrique et boîte d'or guillochés.

- 11°. Les répétitions dites *au tact* ; ces pièces n'ont point de poussoir et ne sonnent point ; mais une aiguille extérieure mobile au doigt, s'arrête sur l'heure du cadran, marquée au pourtour de la boîte par des boutons saillans. On distingue ainsi facilement l'heure par le tact, dans l'obscurité, et, avec un peu d'habitude, les quarts et de moindres intervalles. Le n° 3 *a* indique l'aiguille du tact sur une des deux cuvettes de la boîte, où les heures ont été, de plus, peintes en émail. Cette boîte est à *savonette*, sans cristal. La cuvette supérieure qui porte l'aiguille de tact, s'ouvre d'elle-même à ressort, en pressant le dessus du pendant, pour laisser voir le cadran en émail avec une seule aiguille d'heures, et des subdivisions en quarts, et de 5 en 5 minutes. Ce n° 3 est la grandeur ordinaire ; il y en a de moyennes à l'usage des dames, comme le n° 5, *a b c*, celle-ci porte un cristal sur le cadran ; et de plus petites de col, à peu près de la proportion des n°s 9 et 10, *a b c*.
- 12°. D'autres pièces simples, très plates, de fantaisie, avec ou sans secondes, avec ou sans quantième, de toutes grandeurs. Boîte guillochée, émaillée, avec écusson gravé, etc. Quelques-unes (*de col*) ne s'ouvrent point pour remonter, comme à l'article 10°, et n'ont même qu'une ouverture latérale pour mettre les aiguilles à l'heure avec la clef, fig. 10.
- 13°. Les montres *mixtes*, simples ou à répétition, exécutées au dehors, mais d'après nos plans, et sous notre direction. L'échappement et le régulateur sont finis dans notre établissement.

*Pendules d'appartement.*

- 14°. Nos pendules d'appartement sont de toutes les dimensions en usage, simples ou à demi-secondes, avec sonnerie ordinaire ou sonnerie des quarts, ou répétant l'heure avec les

quarts et pièce de silence. Avec un *pendule simple* ou *compensateur*, quantième simple, ou grand quantième annuel, ou bissextile, équation, âge et phases de lune, échappement à ancre, ou libre simple, ou libre à force constante, à remontoir, etc.; avec une, ou plusieurs de ces fonctions réunies.

Les cabinets sont en bronze doré, côtés pleins ou à glaces, avec ou sans figures, ou en bronze antique décoré ou non de moulures et ornemens dorés, en acajou plein ou à glaces, simples ou avec décors d'architecture.

Une de ces pièces est ornée de deux figures droites sur un stylobate : elles représentent le génie et l'expérience ; le premier est ailé et a une flamme sur la tête : l'autre, largement drapée, porte la suspension d'un *pendule compensateur* qui oscille entre les deux figures, et sert de régulateur au mouvement renfermé dans la base ; au milieu de celle-ci, est le cadran. L'échappement libre simple, ou libre à force constante, sort du dessus de la base pour communiquer avec le centre de la lentille. En bronze tout doré, ou fonds de vert antique, avec moulures et ornemens dorés.

#### *Pendules à tableau.*

- 15°. Des pendules dites à *tableau* ou à paysage, ont leur *mouvement* placé sous une toile peinte, qui représente un site pittoresque, avec fabriques et figures ; on y voit dominer un château, une église ou une tour, avec un cadran d'horloge dont les aiguilles appartiennent au mouvement d'horlogerie caché. Une sonnerie d'heures et de quarts, ou répétant l'heure aux quarts, imite sur différens ressorts-timbres, l'effet lointain des grosses cloches dans la campagne.

#### *Pendules de voyage.*

- 16°. De petites pendules, dites *de voyage* ou *de voiture*, sont en forme de grosse montre, ou en carré long sur la hauteur, ou en forme de *portique* ; mouvement simple avec réveil, ou à répétition, avec sonnerie ordinaire, ou grande sonnerie des quarts, ou répétant l'heure à chaque quart avec pièce de silence, quantième simple, ou grand quantième,

dit *almanach* portant la date entière d'une lettre, secondes, équation, phases et jours de lune ; avec quelques-unes de ces fonctions, ou toutes réunies.

Les formes de grosse montre sont en argent, les formes carrées sont en bronze avec ornément d'architecture ciselés et dorés, avec glaces sur tous les côtés ou en acajou plein. Les formes en *portique* sont en argent, ou en cuivre doré, avec chaînes de support. Les échappemens sont à cylindre de rubis, ou libres sur les principes des chronomètres ; ces pièces marchent ordinairement huit jours, et sur toutes les positions. Elles ont un étui qui peu être attaché dans la voiture, en laissant découverts à volonté, le cadran et le bouton du poussoir pour la répétition.

## SECONDE DIVISION, POUR LA MARINE,

### L'ASTRONOMIE ET LA PHYSIQUE.

*Instrumens destinés spécialement à la MESURE DU TEMPS.*

17°. Horloges marines à deux barillets sans fusée, avec développement de ressort, et arrêt de balancier pour le voyage Marchant 50 et 60 heures.

Les mêmes à fusée, avec développement de ressort et arrêt de balancier, marchant huit jours.

Horloges marines, moyennes et petites, marchant quarante heures.

Ces instrumens, connus par leur emploi pour la navigation, doivent leur régularité et leur solidité à notre construction perfectionnée. Ils réunissent tous les moyens les plus propres à assurer le calcul des longitudes. Ils battent les demi-secondes, et quelques-uns les deux cinquièmes de la seconde. Ils sont suspendus comme la boussole de mer, dans une caisse d'acajou fermant à clef ; on peut fixer la caisse par des vis intérieures ; la suspension peut aussi être arrêtée ; une glace en dessus qui porte un couvercle à coulisse, ou fermant à ressort, permet de voir le cadran sans ouvrir la caisse. Ces horloges marines peuvent remplacer, dans un observatoire, l'horloge astronomique à long *pendule*, et souffrent le transport d'un appartement à un autre sans que



la marche soit altérée. Les caisses forment à peu près un cube, dont les côtés ont depuis 4 pouces juspu'à un pied. Quelques pièces d'une construction particulière, ont quatre barillets sans fusée, et marchent huit jours.

- 18°. Grands chronomètres de poche, à l'usage de la marine et des observateurs. Ils remplacent les anciennes *pendules compteurs*, qui ne peuvent être déplacées sans arrêter leur marche; ils servent à porter l'heure à *bord*; c'est un modèle réduit des horloges marines à 60 h. Il y a aussi deux barillets, sans fusée, qui doivent être remontés tous deux. Il y a double *parc-chute* au balancier; grand cadran de secondes et de minutes excentriques. L'effet ordinaire de la gravure au trait, exagère la dimension de ces pièces, moins apparente dans l'usage et bien portative. Boîte en argent. fig. 11, *a* et *b*.
- 19°. Autres chronomètres de moindre dimension, petit cadran de secondes sous midi, heures et minutes concentriques, à l'ordinaire. Boîte en argent.

*Chronomètres de luxe, et inventions diverses.*

- 20°. Chronomètres avec répétition, fig. n° 8, et de différentes dimensions, mais toujours moindres que celle du n° 11. Boîtes en or, guillochées ou émaillées, ou galonnées, avec gravure, écusson, etc.
- 21°. Chronomètre à tourbillon. Cette construction a la propriété de conserver la même marche sur toutes les positions verticales, et de la rapprocher de la marche à *plat*.
- 22°. Chronomètre à doubles secondes, dit d'*observation*; il a un seul cadran avec double aiguille de secondes, ou deux cadrans et deux aiguilles. Un bouton extérieur sert à arrêter une des aiguilles au commencement d'une observation, et à la remettre en marche à la fin, tandis que l'autre a toujours continué de marcher. La différence de leur position sert de note, en tenant compte des minutes.
- 23°. Chronomètre à équation; au temps solaire se trouve joint le temps moyen, ou le temps sidéral, qui avance régulièrement de 3' 35", 0 sur le temps moyen. Voyez l'article 8.
- 24°. Chronomètre double, contenant dans la même boîte, deux mouvemens indépendans, et sans communication mécanique.

ayant chacun leurs cadran et aiguilles à part. Ils s'influencent physiquement, et leurs légères anomalies sont réduites de plus de moitié. Leur accord soutenu rassure contre les écarts. Une pièce de ce genre a été soumise à de fortes épreuves, et même à celle du *vide*, par le Bureau des Longitudes, sans que les deux aiguilles de secondes aient cessé de battre ensemble le même fraction de seconde; elle est citée dans un rapport à l'Institut. La boîte est d'une dimension moyenne et très plate.

- 25<sup>e</sup>. Pendule *sympathique* qui remet à l'heure et règle une montre à répétition faite exprès, que l'on porte sur soi dans le jour, et que l'on pose la nuit au-dessus de la pendule, dans un porte-montre qui fait partie du décor de la boîte. Si l'on déränge, même exprès, le réglage de la montre, ou si naturellement elle avance ou retarde de plusieurs minutes et même d'un quart d'heure, il suffit de la placer avant midi ou minuit dans son porte-montre, pour qu'à ces deux époques, on voit les aiguilles courir tout à coup, soit en avant, soit en arrière, au point marqué par la pendule. Le réglage intérieur de la montre se rétablit aussi par le même moyen, avec autant d'exactitude que le pourrait faire un artiste, par l'épreuve de plusieurs jours. La pendule est construite en garde-temps très soigné. Son riche cabinet en bronze doré, décoré d'architecture et de peintures en émail, est garni de glaces qui laissent voir le balancier, avec un double spiral cylindrique en or. Le rouage est renfermé dans la base; le cadran est en argent guilloché, le remontoir est à bascule, sans clef.
- 26<sup>e</sup>. Nouveau compteur astronomique à oculaire, pour les lunettes d'observation. Ce compteur est fixé à l'oculaire d'une lunette à *réticule*. Les secondes, les 10<sup>es</sup> de seconde (et même les 100<sup>es</sup> par approximation), y sont rendus sensibles à la vue, par le passage continu de deux aiguilles dans le champ de la lunette, sans que l'œil cesse de fixer l'astre. L'usage de cet instrument se trouve expliqué au-dessous d'une gravure particulière, faite lors de son origine, et que en développe l'effet et la disposition.
- 27<sup>e</sup>. Compteurs militaires, instrumens d'invention récente en forme de montre, et propres à régler le pas de la troupe;

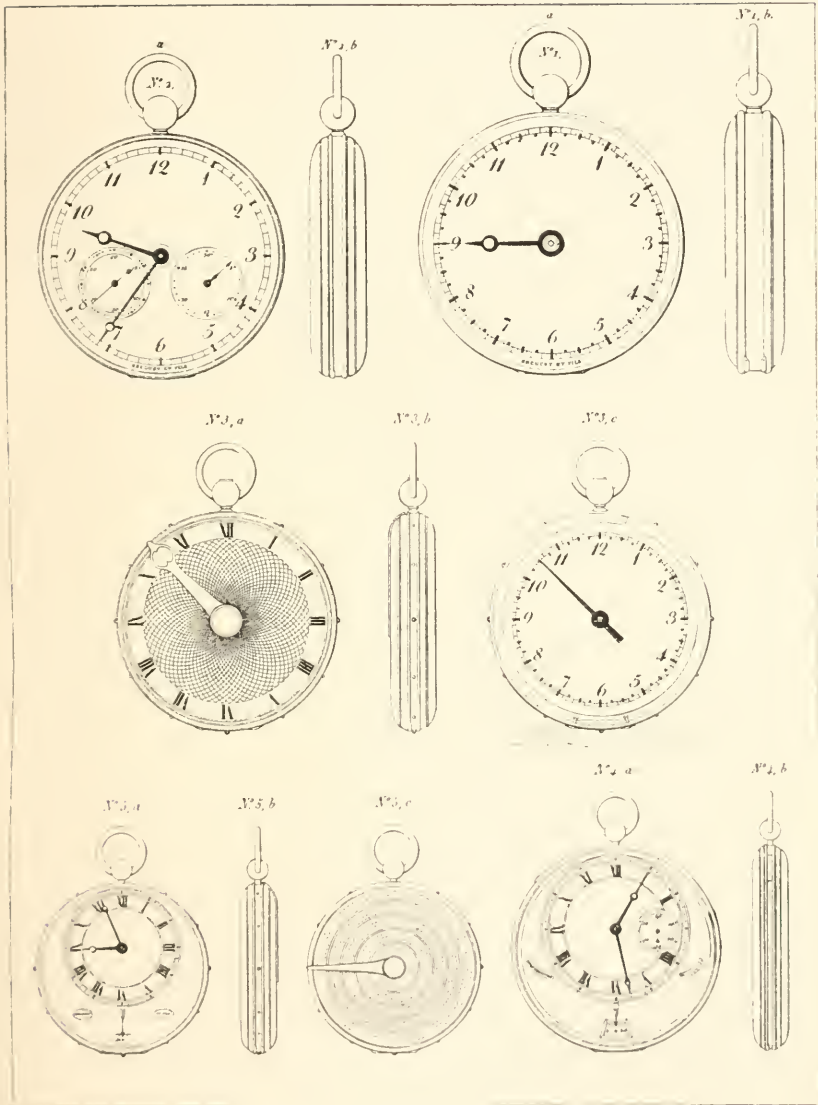
au-dessous du pendant, on trouve un bouton à couronne que l'on fait voler pour conduire une grande aiguille d'avance et retard, dont la position, sur les divisions du cadran, détermine la vitesse des battemens du balancier, et de ceux d'une autre aiguille très apparente qui marque depuis 60 coups jusqu'à 125 par minute. Les battemens peuvent être entendus distinctement près de l'oreille, malgré la musique et le bruit des évolutions.

- 28°. Compteur à *pointage*, destiné à conserver sur le cadran la note écrite par l'instrument même, des fractions de secondes marquées par l'aiguille. Celle-ci, garnie de couleur noire préparée pour plus de cinquante-expériences, dépose instantanément les points voulus, sur un cadran fixe pendant cinq minutes, sans que ces points puissent se confondre. L'effet a lieu par l'enfoncement d'un bouton extérieur, et le mécanisme, qui agit ensuite avec une vitesse inappréciable, est indépendant de la volonté de l'observateur. Cet instrument, d'une précision singulière et d'une construction délicate, originale et sûre, porte, ou un seul cadran avec aiguilles de secondes et de minutes, ou deux cadrans, dont celui de dessous est pour les heures, avec une aiguille extérieure de *répétition au tact*. Ce compteur est un perfectionnement de la première invention faite par un artiste français, qui en prit un brevet en 1821.
- 29°. Thermomètre métallique d'une sensibilité extraordinaire. La lame, très longue sans occuper beaucoup d'espace, est formée de trois métaux de dilatation différente, superposés et soudés; l'épaisseur totale n'a qu'un 50° de ligne; il en a été fait d'un 100°. Cet instrument, soumis à des expériences spéciales par le Bureau des Longitudes, indique très rapidement les petites variations instantanées de la température, dont les thermomètres de construction ordinaire sont affectés trop lentement pour avoir le temps de les marquer. On y a joint une feuille gravée portant la correspondance des trois échelles, *Réaumur*, *Fahrenheit*, et centigrade, et une instruction par M. de Prony, membre de l'Institut du Bureau des longitudes, etc.
- 30°. Grands régulateurs ou pendules à secondes pour les observatoires, les cabinets de physique, etc. Ces horloges astrono-

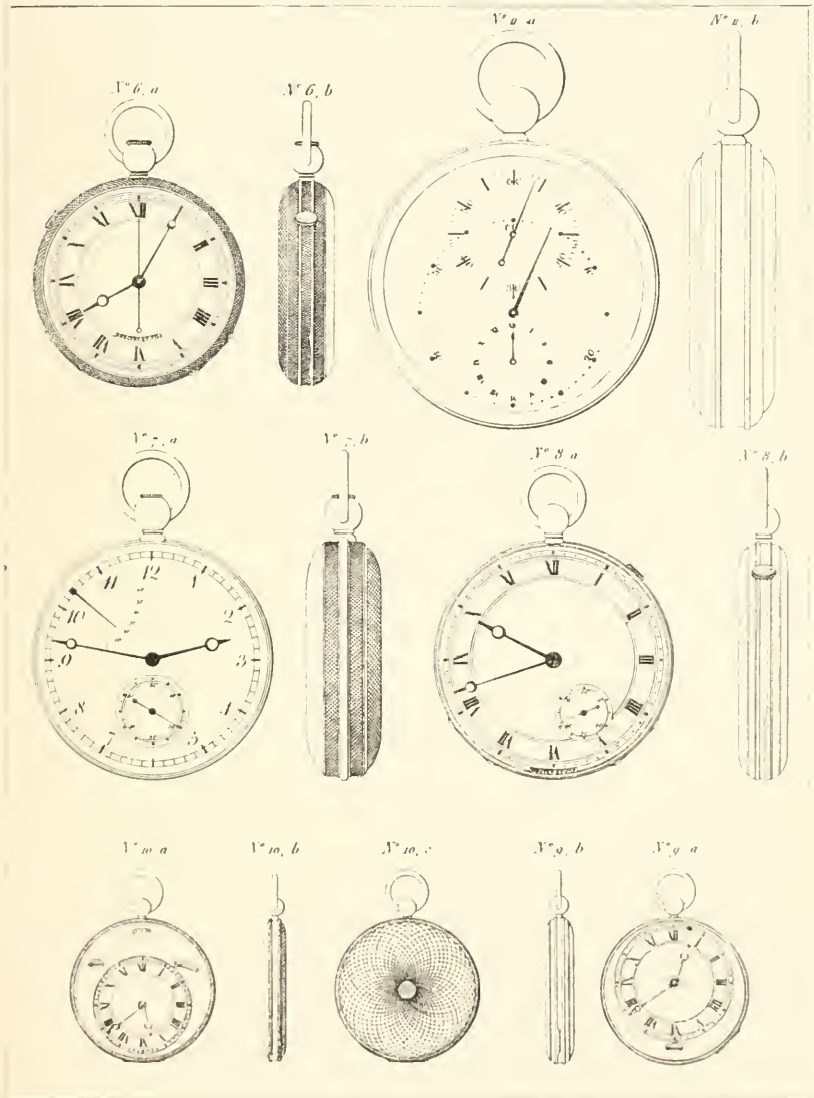
miques à long *pendule*, ont une compensation par le zinc préparé, éprouvée, plus simple et non moins sûre et solide que celle par le laiton. La verge n'a que cinq branches. La suspension est à ressorts garantis par la construction. Échappement à ancre garni de rubis, roue d'échappement dorée. Le mouvement, renfermé par un tambour, est établi sur un fort chevalet en laiton, suspendu au mur par un crochet avec quatre vis à caller. La boîte en acajou est unie et pleine, avec deux portes à glace, l'une en haut pour le cadran, l'autre en bas pour la lentille et les arcs. Ces régulateurs marchent 36 jours; ils suivent à volonté le temps *sidéral*.

- 31<sup>e</sup>. Grands régulateurs doubles, avec deux mouvemens et deux *pendules compensateurs*, ouvrage composé sur les mêmes principes que le *chronomètre double* cité précédemment. Les oscillations des deux *pendules* sont toujours croisées et d'accord, sans communication de mécanisme. Une marche beaucoup plus régulière encore, confirme la théorie de cette construction, qui garantit l'horloge des effets de l'ébranlement de l'édifice. Chaque pendule se divise en trois parties, sans démonter les branches, pour la facilité du réglage, du transport et du placement. La compensation est opérée par le zinc préparé et rendu solide et ductile. La boîte en acajou est garnie de glaces dans toute la hauteur sur trois côtés, avec base et chapiteau ornés de bronzes dorés. La base renferme un fourneau en cuivre, dont la cheminée s'élève en pilastre sur le fond de la boîte jusqu'auprès du chevalet. Celui-ci est en laiton très épais, porté au moyen de trois crochets et de quatre vis à caller, par un fort étrier de fer fixé solidement au mur. La caisse ne touche à aucune partie de l'horloge ni de son armure, et ne sert qu'à la garantir de la poussière : une lampe peut être entretenue au boison dans le fourneau, avec le double but de garantir l'instrument du froid de glace qui coagulerait les huiles, et de faire circuler l'air intérieur de la boîte.

FIN.











SOUSCRIPTION DE MONTRES.



EXPOSITION DE 1819.



## Souscription de Montres D'UNE NOUVELLE CONSTRUCTION.

—  
PAR BREGUET.

QUAI DE L'HORLOGE, No. 51.  
—

**L**ES montres destinées à l'Astronomie et à la Marine, ont acquis de nos jours un très haut degré de perfection.

Il n'en est pas de même de celles que l'on fait pour l'usage civil. Nous n'avons en ce genre que peu de bons ouvrages, et le prix n'en est pas à la portée du plus grand nombre des citoyens.

J'ai pensé que le Public accueillerait favorablement des montres assez parfaites pour tenir le premier rang, après les machines servant à l'Astronomie et à la Marine, lorsqu'il pourrait les avoir à un prix modéré.

Telles sont les montres que je propose : des expériences répétées m'ont assuré quelles sont préférables aux meilleures que j'ai faites, jusqu'à ce jour pour l'usage ordinaire.

Elles se distinguent par leur simplicité et par une disposition qui garantit l'échappement des accident les plus graves, même en cas de chute.

La disposition du rouage, l'échappement, le régulateur, le compensateur du chaud et du froid sont si a découvert et si facile à saisir, que tout observateur attentif peut juger d'un coup d'oeil, sans démonter une seule pièce de l'harmonie du travail et de la sûreté des effets.

Les réparations peuvent être faites en tous pays : elles seront plus faciles et moins coûteuses que celles des montres communes.

Le ressort moteur a deux fois plus de vertu élastique que dans toute autre montre. Il résulte de sa disposition que le degré de tension nécessaire pour faire marcher la machine 36 heures, peut difficilement affaiblir son énergie et ne l'expose point à se casser.

Le régulateur, cette partie essentielle d'une machine qui mesure le tems, est suspendu dans une cage particulière, et si bien isolé, qu'aucune imperfection ne peut échapper à l'artiste qui le visite.

La communication du régulateur avec le rouage, ainsi que sa suspension, sont tout en acier, agissant sur des rubis. Par ce moyen, le régulateur, ne peut se détruire, ni perdre l'uniformité de sa marche.

Ces montres auront en diametre de 25 lignes, et moins d'épaisseur que celles que l'on regarde déjà comme plates, elles n'auront qu'une aiguille.

Cette dimension du cadran donne une distance suffisante d'une heure à l'autre, pour y placer 12 divisions que l'aiguille rencontre de 5 en 5 minutes, et qui sont tellement disposées, qu'il est facile d'estimer l'heure à une minute près.

La Boîte en argent, avec les Baguettes en or, et d'une construction neuve, s'ouvrira des 2 côtés d'une manière plus simple et plus commode.

Pour détromper le Public sur les ouvrages auxquels je n'ai en aucune part, et que l'on répand sous mon nom, je mettrai sur le cadran une marque particulière exécutée par une machine dont les effets sont très difficiles à imiter, et qui contera à contrefaire beaucoup plus que l'on ne pourrait y gagner.

Il faut pouvoir faire un certain nombre de montres à la fois, pour donner à leur exécution, toute l'uniformité et la perfection que je désire. Mais pour cela une mise de fonds est nécessaire. Le Moyen de se les procurer par un emprunt, oblige de supporter un intérêt énorme, que dans l'état actuel des choses, aucune industrie honnête ne peut couvrir. J'ai pensé qu'une souscription serait préférable et que le souscripteur qui payerait une partie d'avance, trouveroit son indemnité dans la modération du prix d'acquisition.

Le prix des montres telles qu'elles viennent d'être annoncées, sera de 600 liv.; le quart de cette somme se payera en souscrivant; la construction ne souffrira point de retard, et la livraison se fera suivant l'ordre des souscriptions, dans un tems fixé par la quittance.

## EXPOSITION DE 1819.

### PRODUITS DE LA MAISON BREGUET

EN 21 OBJETS DIFFERENTS, NOUVEAUX OU PERFECTIONNES.

#### LETTRES A ET B.

HORLOGE ASTRONOMIQUE DOUBLE AND MONTRE DOUBLE.

*Establishes sur les principes des Horloges Astronomiques Marines.*

**C**ES constructions ont été imaginées pour prévenir l'influence d'un mouvement étranger communiqué accidentellement aux corps oscillant, dont la fonction est de mesure le temps. L'horloge astronomique a deux pendules, et la montre deux balanciers, entretenus en mouvement dans chaque pièce, par deux rouages absolument indépendant l'un de l'autre. Cette disposition a la propriété d'annuler les résultats des mouvements locaux dans la marche des horloges à pendule provenant des ébranlement de l'édifice du défaut de solidité, de l'agitation de l'air, etc. ainsi que ceux qui peuvent avoir lieu dans les garde-temps de poche, par les secousses du porter, les changements de position, etc. . . . et de faire disparaître, dans la marche de ces machines des causes d'anomalies auxquelles l'art n'avait encore pu remédier.

Dejà l'on avait aperçu que plusieurs horloges à pendule, placées sur une même planche, s'influençaient; on attribuait vaguement cet effet, où a l'ébranlement de la planche ou au mouvement de l'air déplacé par les lentilles, mais on ne voit pas qu'il ait été fait d'expériences suivies à ce sujet. Nous avons reconnu, par des expériences spéciales, la véritable cause de cette communication du mouvement, et nous en avons conçu la possibilité de faire servir l'influence réciproque de deux horloges à la régularité de leur marche.

Les deux pendules régulateur de l'horloge astronomique double, sont placés l'un en avant de l'autre, et suspendus à

couteau sur un même bras au support de cuivre fondu faisant partie d'un étrier plein et très fort qui soutient toute l'horloge. Les oscillations de chaque pendule sont entretenues par un rouage en sorte qu'il y a 2 rouages, deux échappements et deux cadrans, marquant chacun l'heure, la minute et la seconde, ces deux mouvements n'ont entre eux aucune communication mécanique. Le poids seul est commune aux deux horloges, pour plus de simplicité dans la construction.

Les oscillations des deux pendules régulateurs s'influencent réciproquement par le seul ébranlement qu'elles produisent dans la masse du support, car la matière du support et de l'étrier étant douée d'élasticité, comme toute matière solide l'un des deux pendules ne peut se porter au-delà de son centre de gravité, sans que le point de suspension n'éprouve un tirage oblique et un déplacement presque insensible, mais réel qui suffit pour faire sortir le point de suspension de l'autre pendule de la verticale qui passe par son centre de gravité, et dans laquelle celui à l'instant trouve immédiatement en action de se retablir.

Ainsi lorsque l'on arrête un des deux pendules et que l'on suspend l'action de son échappement tandis que l'autre pendule continue à osciller, le pendule arrêté et laissé libre, reprend insensiblement des oscillations en sens opposé à celles du pendule qui a continué de marcher; et ces oscillations d'abord infiniment très petite, acquièrent peu à peu de l'étendue, j'usqu'à ce qu'elles aient atteint l'amplitude des arcs de l'autre pendule.

Pour s'assurer si le mouvement de l'air influait dans cette expérience, on a enfermé dans une caisse de verre, l'un des corps resté en repos et l'on a intercepté suffisamment la communication directe de l'air. On a reconnu que le mouvement se communiquait, toujours, et que le déplacement de l'air n'avait pas dans cet expérience d'effet appréciable.

Si l'on fait retarder ou avancer une des horloges, de douze à treize secondes en changeant la longueur de son pendule, celui qui est resté réglé, corrige la plus grande partie de cette différence, et les deux horloges forcées de s'accorder par leur influence réciproque, prennent une marche égale et commune.

Les secousses qu'un édifice éprouve par le roulement des voitures, ou par défaut de solidité altèrent inévitablement la marche d'une horloge à pendule; on sait aussi qu'un horloge de

ce genre étant réglé dans sa caisse fermée, on ne peut laisser celle-ci ouverte, sans que la marche de l'horloge ne change de plusieurs secondes en vingt quatre heures. Ces inégalités dans la marche, qui éludaient les efforts de l'art, sont annulées ici parceque les deux pendules régulateurs se croisant dans leurs oscillations, ces effets ne peuvent s'opposer au mouvement d'un pendule, sans aider de la même quantité le mouvement de l'autre. On a oté entièrement la caisse de l'horloge double, dont l'étrier était fixe solidement au mur : on la laissé marcher ainsi pendant plusieurs jours, même une partie du temps auprès d'une fenêtre ouverte et l'air étant agité, sans que l'on ait reconnu la moindre altération dans sa marche.

Les autres anomalies, qui peuvent provenir du rouage, de l'échappement, ou de la compensation, sont aussi corrigées ou considérablement réduite par cette construction.

Nous avons exécuté sur ce même principe des montres à mouvement double dans une même boîte peu élevée, et d'un diamètre moyen, elles ont deux rouages indépendants, deux balanciers et deux aiguilles de secondes. Les balanciers sont voisins et peuvent être rapproché ou éloignés à volonté. La première de ces montres, établié pour S.A.R. le Prince Régent, a été pendant 3 mois entre les mains de deux membres du bureau des longitude M. and Min. Bouvard et Arago—sans que les deux aiguilles de secondes aient différé d'un seul battement. On en a placé une deux fois sous le récipient de la machine pneumatique, et l'on a maintenu le vide pendant vingt quatre heures ; dans ces expériences, anisi qu'au porter, à plat, ou au crochet les deux aiguilles ont toujours battu ensemble la même fraction de seconde.

Toutes les expériences faites sur ces deux machines ayant été connues des membres du bureau de se longitudes, celles qui concernent la montre double et ont un rapport plus particulier avec la théorie des cordes vibrantes, se trouvent citées, ainsi qu'il suit dans un rapport fait par Mr. Biot, aux académies des sciences et des beaux arts, sur le Mémoire de M. Savart, touchant la construction des instrument à corde et à archet.

“Nous ne pouvons mieux terminer, dit Mr. Biot, ces  
 “remarques sur les vibrations communiquées, qu'en rapportant  
 “une curieuse expérience de notre confrère Mr. Breguet, qui  
 “met ces effets dans la plus complète, comme la plus

“remarquable évidence. Mr. Breguet, a construit des montres  
 “qu’il appelle doubles, parcequ’elles renferment dans une  
 “Boîte, de dimension ordinaire, deux mouvements complète,  
 “tout à fait indépendants l’un de l’autre, mais fixés sur la même  
 “platine métallique. Chacun de ces mouvements conduit les  
 “aiguilles d’heure, de minute et de seconde, dont la marche lui  
 “est uniquement soumise. Or, quoique cette marche ne soit  
 “jamais rigoureusement la même pour les deux systèmes,  
 “quand chacun agit seul, néanmoins, lorsqu’on les fait agir  
 “ensemble, s’ils diffèrent peu dans leur marche, ils finissent  
 “bientôt par s’accorder parfaitement, en vertu de leur influence  
 “réciproque qui se communique de l’une à l’autre par la  
 “platine commune à laquelle ils sont fixés tous deux. Une de  
 “ces montres doubles, suivie pendant trois mois à l’observatoire,  
 “à offert ainsi entre ses deux mouvements un accord tel, que  
 “les deux aiguilles de secondes, ont toujours battu également  
 “la même seconde sèche, sans se quitter durant tout cet  
 “intervalle de temps, quoique, en vertu de ces petites inégalités  
 “inévitables que les meilleurs chronomètres éprouvent la  
 “marche commune au double système ait offert de légères vari-  
 “ations; et a qui achève de prouver que cet accord merveilleuse  
 “est causé par l’influence mutuelle des petites vibrations trans-  
 “mises d’un système à l’autre par la platine métallique qui les  
 “porte, c’est que les deux systèmes se maîtrisent l’un l’autre  
 “d’autant plus énergiquement, qu’ils sont rapprochés sur cette  
 “platine; à mesure qu’on les rapproches, on peut détruire, par  
 “leur réaction mutuelle, une différence plus grande entre leurs  
 “marches isolées. Mr. Breguet, pense qu’une combinaison  
 “de deux mouvements est plus stable dans son uniformité,  
 “qu’un mouvement unique, et qu’elle doit mieux résister aux  
 “causes perturbatrice étrangères.”

### LETTRE C.

#### NOUVEAU COMPTEUR ASTRONOMIQUE.

Ce compteur est fixé à une lunette d’observation. Les  
 secondes, les dixièmes de secondes, et même les centièmes approxi-  
 mativement, y sont rendus sensibles à la vue, par le mouvement



continu de deux aiguilles dans le champ de la lunette. L'usage de cet instrument est expliqué au dessous de la gravure qui'on a été faite récemment.

LETTRES D ET E ; et D et E.

HORLOGE MARINE MARCHANT HUIT JOURS.

*Horloge marine marchant 50 heures.*

*Le mouvement de la même pièce vu à découverts. Mouvement à découverts d'une horloge marine à 4 Barillets marchant 8 jours.*

Les deux premières pièces sont établies, avec leur suspension, dans leur caisse, comme elles sont employées sur un bâtiment.

d.—Un mouvement découvert laisse voir la construction de ces horloges; la force motrice y est garantie d'accident. Le mécanisme compliqué de la fusée en y comprenant la chaîne, le ressort auxiliaire, le double encliquetage, l'arrêt de la chaîne, etc. . . est supprimé et remplacé par deux barillets dentés. Ce moyens qui évite une foule de cause d'arrêts et d'inégalités, n'est point employé comme on l'a fait quelque fois pour augmenté la force motrice mais uniquement pour la rendre au contraire plus douce, plus constamment vive, tout a fait élastique, empêcher que les ressorts ne se rompent ou ne se rendent, et réduire en même temps les frottements.

Chacun des deux barillets a trois fois et demi la capacité du barillet à fusée d'une montre marine ordinaire de même diamètre, et il n'a pas à produire la moitié de cette dernière force; on a donc pu employer un ressort beaucoup plus long et plus flexible. Les seuls tours du milieu, dont le développement est employé à la marche totale de la pièce, et dont les lames-refrottent pas entre elles, sont très loin d'atteindre la limite d'élasticité des ressorts; qui ne peuvent ainsi ni se forcer, ni se rompre; leur diminution, progressive de force, du haut en bas est moindre que les inégalités de force inévitables et irrégulières de la meilleure fusée, avec son ressort.

Les deux barillets agissent en sens opposé sur le pignon du centre, et la pression, de chacun est moindre que la moitié de celle d'une fusée; les direction opposée de leurs forces, soulagent mutuellement les pivot, qui éprouvent beaucoup moins d'effort et de frottement, le double engrenage est déposé pour faire

commencer la menée d'une aile par une dent d'un barillet, au milieu de la menée de l'aile conduite par l'autre barillet. Il en résulte une diminution considérable, dans le frottement de l'axe de ce premier mobile, et plus d'égalité dans l'engrenage, ce qui permet de réduire encore plus la force motrice.

Le rouage est tout à fait séparé des barillet et des pièces qui composent l'échappement; celui-ci qui répare de deux en deux vibrations la perte de mouvement du régulateur, est contenu avec lui dans une cage particulière, presque isolée du reste de la machine, et que l'on en sépare facilement; cette disposition produit l'important avantage de pouvoir en confier séparément le travail à l'artiste le plus habile, dont il exige à la fois, tant d'intelligence, d'attention soutenue et scrupuleuse, jointes aux connaissances de théorie et de pratique pour l'ensemble des fonctions. Ce n'est que par la réunion de ces moyens qu'il peut espérer de prévenir la destruction, les anomalies, et la plupart des influences qui affectent cette partie si délicate et si importante des horloges marines.

e.—Dans le mouvement découvert de l'horloge marine à quatre barillets, les moteurs sont disposés pour obtenir, comme dans l'horloge précédente, une plus grande réduction de force motrice par la suppression de la fusée et la diminution de frottement du premier mobile, en employant des ressorts encore plus faibles, plus doux et d'autant mieux préservés de fracture. Les barillets occupent deux cages où ils sont placés en opposition, et sur deux lignes à angle droit; l'axe qui reçoit leur action, également pressé de tous les côtés, reste comme suspendu au milieu du rouage, et ses pivots, qui usent beaucoup dans les constructions ordinaires, n'éprouvent ici presque point de frottement. Les quatre engrenages ne prenant à la ligne des centres que l'un après l'autre. Cette pièce a de plus une disposition particulière, dans la roue d'échappement, qui prévient l'inertie du rouage ou son engourdissement, et rends l'impulsion toujours vive et plus constante.

## LETTRE F.

### HORLOGE MARINE A HÉLICE.

L'échappement de cette pièce est à hélice, sans aucun frottement dans l'action sur le régulateur. Dans tous les

échappements libres, l'impulsion qui répare la perte du mouvement, et entretient les vibrations, s'opère sur la levée, avec un glissement semblable à celui des engrenages, entre la courbe de la dent et le flanc de l'aile. Ici la levée est conduite par développement, sans éprouver le glissement ordinaire et la frottement qui en résulte. Cette pièce marque les secondes d'un coup par un rouage particulier, et les fraction de seconde par l'aiguille propre du mouvement; elle porte deux indications du développement des ressorts.

## LETTRE G.

GARDE-TEMPS DE POCHE SIMPLE.

*Sur un calibre nouveau.*

Propre aux observations astronomiques, et à déterminer la longitude.

## LETTRE H.

MONTRE SIMPLE A ÉQUATION.

*Avec un quantième perpétuel Simplifié.*

Elle marque les secondes d'un coup, et est établie suivant les principes des horloges marines.

## LETTRE I.

MONTRE.

*Etablie pour S. A. R. Monseigneur le Duc de Cambridge.*

Cette montre, exécutée avec la plus grande recherche de travail, est un garde temps a secondes, répétition a demi-quart et quantième.

## LETTRE K.

MONTRE.

*Etablie pour S. M. l'Empereur de Russie.*

Dans une dimension moyenne, très peu élevée, cette montre offre une répétition, une équation, et un quantième perpétuel. Elle porte une autre indication de l'heure au tact, qui donne les quarts par approximation; et est établie dans l'étui qui forme une double boîte.

## LETTRE L.

## HORLOGE MARINE ET MONTRE À LONGITUDES.

*Exécutées pour Mr. le Comte de Sammariva.*

Ouvrage composé d'une horloge marine à Tourbillon, dont l'échappement est à remontoir indépendant et à force constante. Elle porte dans une cassolette inclinée faisant une révolution en cinq minutes, la montre à longitudes, qui 'éprouve alors l'effet du Tourbillon, la montre est à équation, quantième annuel etc. . . . Tout le mécanisme est visible au travers du cadran et d'une double cuvette qui sont en cristal de roche. Les détails on sont développés dans une notice imprimée pour ces deux pièces.

## LETTRE M.

## PENDULE ET MONTRE SYMPATIQUES.

Cette invention se compose d'une horloge marine, qui règle montre et la met à l'heure. Ce régulateur, d'une construction singulière, forme une pendule richement décorée, qui sert en même temps de porte montre. Si l'on dérange le réglage de la montre, ou les aiguilles avancent ou retardent de quelques minutes, et même d'un quart heure il suffit de la poser avant midi ou avant minuit dans la place qui lui est destinée au dessus de la pendule, pour qu' elle soit réglée de nouveau et remise à l'heure exactement. Cette montre est à répétition. Ces deux ouvrages sont présentés ici avec des perfectionnements.

## LETTRE N.

## MONTRE MARINE.

*Portative d'une forte proportion.*

Dans cette montre, exécutée sur le plan des horloges marines. on a sacrifié la commodité à l'exactitude et à la solidité, sans avoir égard au volume de la pièce.

## LETTRE O.

## MONTRE ASTRONOMIQUE.

*Portative.*

On peut à volonté faire suivre à cette montre le temps sidéral ou le temps moyen; elle est disposée pour avertir, par une sonnerie, l'astronome, avant l'instant de l'observation.

## LÉTTRE P.

## GARDE-TEMPS À TOURBILLON.

L'échappement libre de cette pièce est établi avec le balancier régulateur sur une platine particulière, qui est elle-même un des mobiles du rouage, et tourne sur son axe avec tout l'échappement, en une ou plusieurs minutes, suivant le calibre le mouvement de rotation fait éprouver aux pièces de l'échappement, dans un intervalle très-court, toutes les positions verticales auxquelles une montre peut être exposée. Les diverses positions se succédant continuellement le frottement se distribue avec plus d'égalité sur les pivot du régulateur, et les effets d'excentricité et des différences de pénétration s'entre détruisent; il en résulte une marche moyenne régulière, ou dont les irrégularités infiniment petites, ne peuvent s'accumuler d'une quantité sensible, pendant la moitié de chaque révolution.

## LÉTTRE Q.

## COMPTEUR MILITAIRE.

*Pour sa M. l'Empereur de Russie.*

Instrument en forme de montre, destiné à régler le pas de la troupe, en donnant à volonté depuis 60 jusqu'à 120 pas dans une minute. Un officier peut même à cheval, tenir cet instrument d'une main, et en faire varier le mouvement à volonté. Les battements qui battent les pas sont rapportés à la vue très sensiblement, par les mouvement d'une aiguille qui parcourt de grandes divisions. En tenant l'instrument à l'oreille, les battements peuvent être entendus distinctement, malgré le bruit des évolutions militaire.

## LÉTTRE R.

## NOUVEAU THERMOMÈTRE.

*Métallique, d'une Sensibilité Extraordinaire.*

Ce thermomètre est spécialement destiné à indiquer les changements instantanés de température, dont les thermomètres de liquide ou d'air sont affectés trop lentement, parce qu'il faut

dans ceux-ci que le calorique traverse l'enveloppe de verre, mauvais conducteur, pour pénétrer le liquide, et que la dilatation du verre produit au premier instant sur l'assension, un effet contraire à celui de la dilatation propre du liquide.

Le nouveau thermomètre éprouve sans intermédiaire l'influence de la température. Il est composé de trois lames, en platine, en or et en argent, dans l'état de la plus grande pureté. Elles n'ont ensemble qu'un quarante huitième de ligne d'épaisseur. On en a même exécuté d'assez délicates, pour n'avoir toutes trois ensemble qu'un centième de ligne. L'expérience suivante, répétée par M.M. Charles, Biot, etc. . . prouve combien cet instrument est plus sensible que le meilleur que l'on puisse faire avec le mercure.

Deux thermomètres l'un de Breguet, l'autre en mercure, réglés tous deux sur l'échelle de Réaumur, ont été placés sous le récipient de la machine pneumatique; un troisième, aussi en mercure, a été placé en de hors du récipient; ils marquaient tous trois  $15^{\circ}$  au dessus de  $0^{\circ}$  glace. On procéda à faire le vide, qui fut effectué en 18 secondes. Le thermomètre de Breguet descendit très rapidement à  $3^{\circ}$  au dessous de  $0^{\circ}$  glace (de 18 degrés), tandis que le thermomètre en mercure de l'intérieur du récipient n'était encore descendu qu'à  $13^{\circ} \frac{2}{3}$  (de  $1^{\circ} \frac{1}{3}$ ). En moins de 2 minutes le nouveau thermomètre remonta dans le vide à sa première station de 15 degrés. On laissa ensuite rentrer l'air dans le récipient ce qui eut lieu en 4 ou 5 secondes. Le thermomètre de Breguet s'éleva à  $40^{\circ}$  au dessous de  $0^{\circ}$  glace (de 25 degrés), tandis que celui en mercure qui l'accompagnait descendait en ce même moment. L'expérience a été répétée un grand nombre de fois, toujours avec les mêmes résultats à très peu près, suivant que l'on opérait plus ou moins promptement.

Les lames et l'aiguille de ce thermomètre sont placées au centre d'un cercle divisé en 100 parties. Le point de  $0^{\circ}$  se trouve sur le côté diamétralement opposé au support des lames; c'est de là que partent 50 divisions sur la droite, et 50 sur la gauche. On conçoit qu'elles ne peuvent se rapporter à aucune échelle connue; mais l'instrument ne devant servir qu'à des physiciens ou à des amateurs, il leur sera facile d'en établir par quelques expériences le rapport à telle échelle qu'ils voudront, et de le vérifier si quelque chose avait pu déranger la situation de l'aiguille,

L'extrême sensibilité de ce thermomètre, qui en fait un instrument si précieux en physique, le rend également propre aux usages ordinaires. Exposé dans une chambre, s'il n'est pas couvert de son récipient, on le verra dans une oscillation continuelle; couvert, il indiquera les variations de la température, de même que les meilleurs thermomètres en mercure.

## LETTRES S ET T.

## PENDULE DE VOYAGE.

*A répétition à grande sonnerie et à réveil. Pendule de voyage plus petite, seulement à répétition et réveil.*

Ces pendules, quoiqu'elles soient destinées à l'usage civil, sont exécutées suivant les principes des montres-marine; elles sont disposées pour la plus grande commodité des voyageurs. Elles ont sur le cadran les quantièmes du mois, de la semaine et de l'année, les phases et l'âge de la lune. Elles sont contruites pour supporter toutes les positions sans se déranger. On les renferme dans une caisse que d'attache aux parois de la voiture. Diverses parties de cette caisse peuvent rester ouvertes à volonté, pour laisser voir le cadran, pour faire sonner la répétition, etc. . . Placées sur une cheminée ou sur un meuble, elles tiennent bien d'une excellente pendule. Elles marchent huit jours.





PLATES.



## PLATES.

PHOTOGRAPHY cannot do justice to the beautiful appearance of the dials and works, since these are metal, yet a fair idea can be formed of the various models here shown. The numbers are those of the watches and clocks, also the numbers in the Collection, given for reference, in Chapters V. and VI., thus detailed descriptions can easily be found.

A rather unusual course is followed in this volume, for the Plates come at the end of the volume, instead of the Appendix. The reason for this is, that the paper upon which the Plates are printed being thicker than the paper used for the text, the reader will find the method employed far more convenient for reference. This is further facilitated from the fact that the list describing the watches is printed on one side only. Thus, the continual turning over of leaves is avoided. The plates are also arranged so that the book need not be turned sideways to view them. The greatest care has been taken in the production of the Plates, since they form, probably, the most interesting part of the volume. The Plates follow in order the list of the watches and clocks.

Only the movements are shown where special interest exists, and many of them are annotated, that points described in the Technical Chapter may be followed. Breguet's dials are so artistic and interesting that these are shown, even when the works are not. For those who are technical, and for those in the trade who manufacture clocks and watches, the photographs must have a special interest and open the eyes of many to what can be done by a genius in mechanics such as Breguet was.

The watches are shown actual size, but some of the clocks had to be reduced to suit the size of the page. In these instances the measurements of actual sizes are given.





No. 1.

Watch No. S3.

The collar seen above the XII turns to ring out the hour or the date or to lock the piston.



No. 1.

Watch No. S3.

VIEW UNDER DIAL.

The curb compensation, parachute, and a rare type of straight line gong can be seen.

THE WATCH REPEATS HOUR AND DATE. THE COLLAR FOR THIS IS AT PENDANT.





No. 2.

FRONT.

Watch No. 2980.



No. 2.

VIEW OF WORKS AT BACK.

Watch No. 2980.

Tourbillon Watch, showing Tourbillon.







No. 3.

Watch No. 2788.

FRONT.



No. 3.

Watch No. 2788.

VIEW OF WORKS AT BACK.

The protecting ring round each balance is seen.

Watch sold to the Prince Regent for George III.,  
with two complete movements.





*No. 3.*

*Watch No. 2788.*

VIEW OF WORKS UNDER DIAL.

Watch sold to the Prince Regent for George III.,  
with two complete movements.





No. 4.

FRONT.

Watch No. 2794.



No. 4.

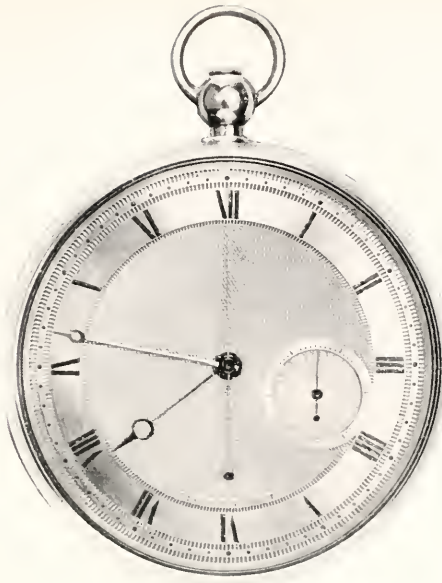
WORKS AT BACK.

Watch No. 2794.

Watch of Louis XVIII.

With two complete movements





No. 5.

FRONT.

*Watch No. 121.*

No. 5.

WORKS UNDER DIAL.

*Watch No. 121.*







No. 5. *Watch No. 121.*  
WORKS AT BACK.

The repeating main-spring is seen at top on the right. The independant seconds wheel (very thin) is shown at centre. Also flirt star wheel. Parachute also shown above balance pivot.





No. 6. *Watch No. 148.*  
FRONT.



No. 6. *Watch No. 148.*  
WORKS UNDER DIAL.  
"PERPETUELLE" WATCH.





No. 7.

Watch No. 119.





No. 8.

FRONT.

Watch No. 1256.



No. 8.

BACK VIEW.

Watch No. 1256.







No. 9.

Watch No. 4000.



No. 9.

Watch No. 4099.

Watch out of its savonnette case.  
The case also shown.





No. 10.

Watch No. 2934.





No. 11.

Watch No. 4274.





No. 12.

Watch No. 695.

FRONT.



No. 12.

Watch No. 695.

BACK.

Watch given by Lucien Bonaparte to his  
sister, the Queen of Naples (Caroline).







No. 13. *Watch No. 124.*  
"PERPETUELLE" WATCH.





No. 14.

Watch No. 4579.

FRONT.



No. 14.

Watch No. 4579.

WORKS AT BACK.





No. 14.

Watch No. 4579.

WORKS UNDER DIAL.





No. 15.

Watch No. 2569.

“TOURBILLON.”







No. 16.

Watch No. 186.





No. 17.

Watch No. 2623.





No. 18.

Watch No. 2461.



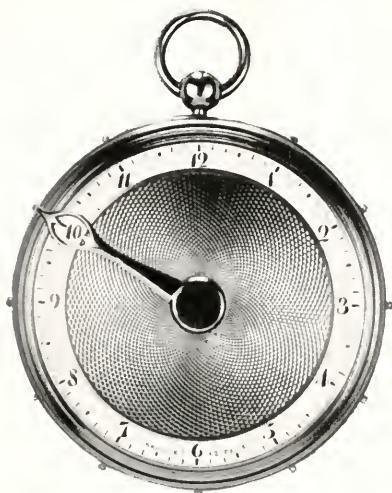


*No. 19. Watch No. 4105.*

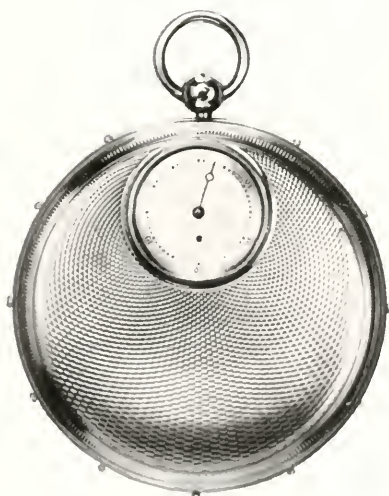
The small dial for marking engagements  
is set by hand.







No. 20. *Watch No. 3496.*  
FRONT.



No. 20. *Watch No. 3496.*  
BACK.

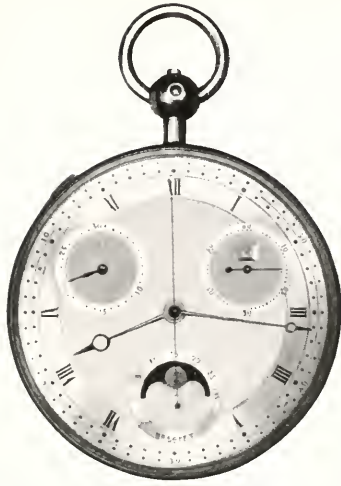




No. 21.

Watch No. 3012.





No. 22.

Watch No. 4850.



No. 22.

Watch No. 4850.

Shows Watch out of savonnette case and  
the case.



*No. 23.**Watch No. 51.*

When the XII is under pendant, the repeating piston is locked. To repeat, open the front and turn dial to the left. Then the piston is free.







No. 24.

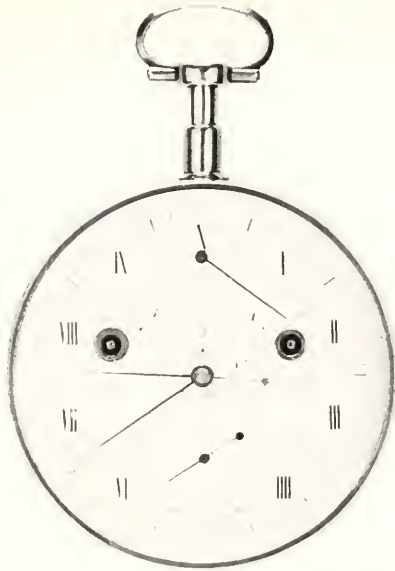
FRONT VIEW.

Watch No. 4051.



*No. 25.**Watch N. 402.*





No. 26.

Watch No. 6.

Side showing Revolutionary time.



No. 26.

Watch No. 6.

Side showing mean time.



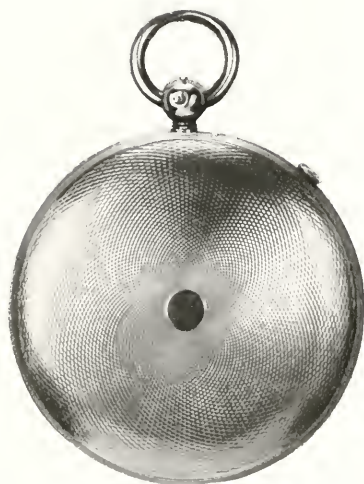


No. 27.

Watch No. 2544.







*No. 28.*

*Watch No. 3518.*

Both sides alike.

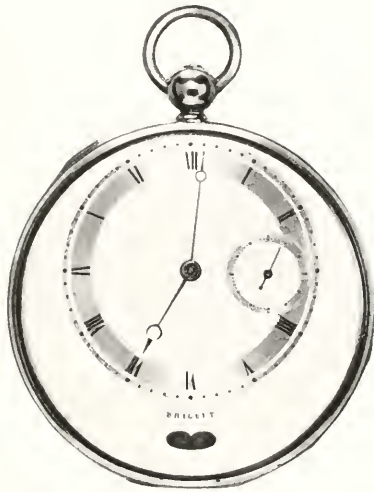




No. 29.

Watch No. 3066.





No. 30.

Watch No. 423S.





No. 31.

Watch No. 4375.

Both sides alike.







No. 32.

Watch No. 3647.

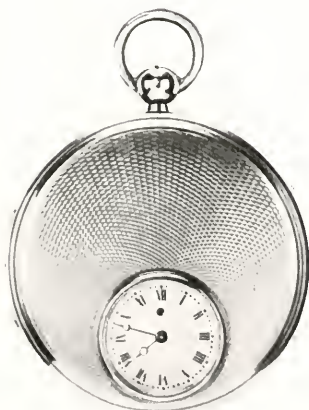




No. 33.

Watch No. 987.

FRONT.



No. 33.

Watch No. 987.

BACK.

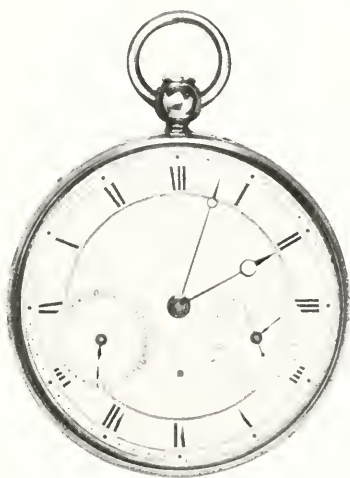




No. 34.

Watch No. 4578.





*No. 35.*

*Watch No. 3519.*







*Fig. 30.*

*Watch No. 3917.*





Vol. 37. *Watch No. 4993.*  
Inking Chronograph.





No. 38. Watch No. 4600.

Watch out of case.



No. 38. Watch No. 4600.

Case shown "tact" side.



No. 38. Watch No. 4600.

Back of case removed from bezel.





No. 39.

Watch No. 1088.

FRONT.



No. 39.

Watch No. 1088.

BACK OPEN.







No. 40.

Watch No. 4905.





No. 41. *Watch No. 852.*  
FRONT.



No. 41. *Watch No. 852.*  
BACK VIEW.





No. 42.

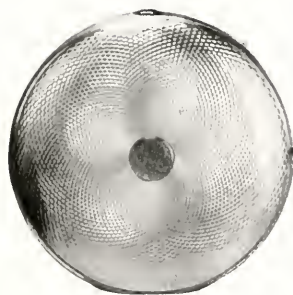
Watch No. 3661.





No. 43.

Watch No. 4321.



No. 43.

Watch No. 4321.

Watch out of case and its case.







No. 44.

Watch No. 4627.





*No. 45.*

*Watch No. 2187.*





No. 46.

Watch No. 2615.

FRONT.



No. 46.

Watch No. 2615.

BACK.





*No. 47.*

*Watch No. 3542.*







No. 48.

Watch No. 4214.

FRONT.



No. 48.

Watch No. 4214.

BACK.





*No. 49.*

*Watch No. 5047.*





No. 50. *Watch No. 2070.*  
FRONT.



No. 50. *Watch No. 2070.*  
BACK.  
Queen of Westphalia's Watch.



*No. 51.**Watch No. 1200.*

FRONT.

*No. 51.**Watch No. 1200.*

Back showing works.







No. 52.

Watch No. 2912.

FRONT.



No. 52.

Watch No. 2912.

WORKS AT BACK.





No. 53.

Watch No. 1052.

FRONT.



No. 53.

Watch No. 1052.

BACK.





No. 54. Watch No. 5038.

FRONT.



No. 54. Watch No. 5038.

BACK.





No. 55. Watch No. 5019.







*No. 56.* *Watch No. 160.*

FRONT.  
Works seen through crystal dial.



*No. 56.* *Watch No. 160.*

WORKS AT BACK.  
The "Marie Antoinette" "Perpetuelle" Watch.





No. 57. FRONT. Watch No. 92.  
Square on dial to set date.



No. 57. BACK. Watch No. 92.





No. 57.

Watch No. 92.

WORKS UNDER FRONT DIAL.

The date wheel and equation of time cam are seen.



No. 57.

Watch No. 92.

WORKS UNDER BACK DIAL.

The Moon disc turns once in 50 days.  
 The thin independent seconds wheel and the double flirt star are well seen at and near centre. Lever left side of dial moves hand which shows how much wound. Lever right side is to regulate.





No. 58. Watch No. 5075.  
FRONT.



No. 58. Watch No. 5075.  
BACK.  
Jerome Bonaparte's Watch.







No. 50. Watch No. 4760.



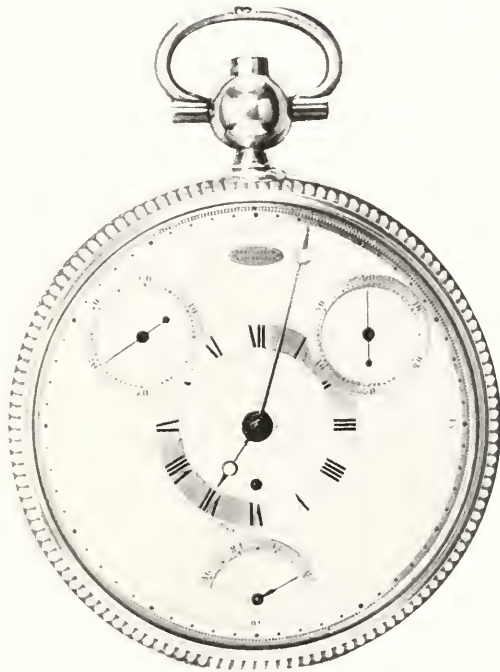


*No. 60.* *Watch No. 4863.*  
FRONT (Open).



*No. 60.* *Watch No. 4863.*  
WORKS AT BACK.

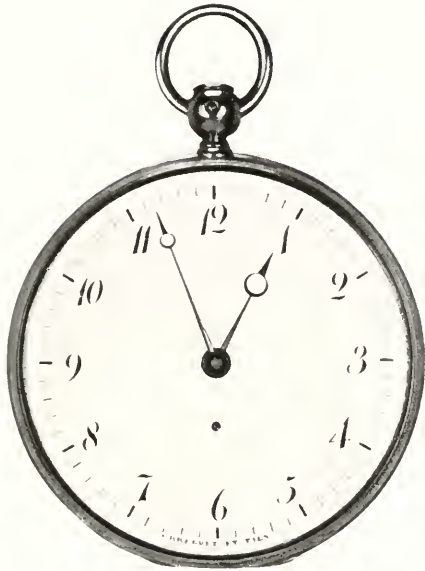




No. 61. *Watch No. 1187.*  
The right small dial is chronograph.

“TOURBILLON.”





No. 62.

Watch No. 3872.







No. 63.

Watch No. 3624.

FRONT.



No. 63.

Watch No. 3624.

WORKS AT BACK.

Winds up centre of dial and also at back.

"SUBSCRIPTION" WATCH.





No. 64.

FRONT.

Watch No. 4004.

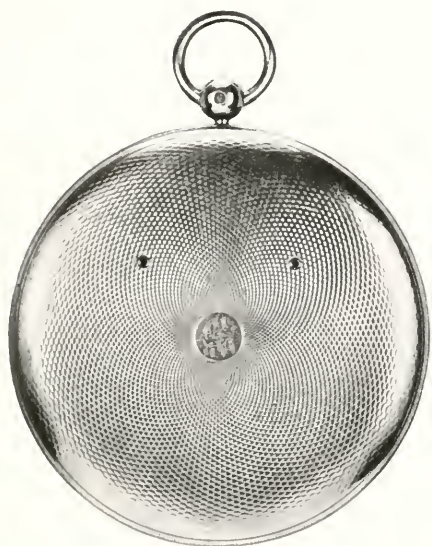


No. 64.

Watch No. 4004.

Works at back showing the two barrels.



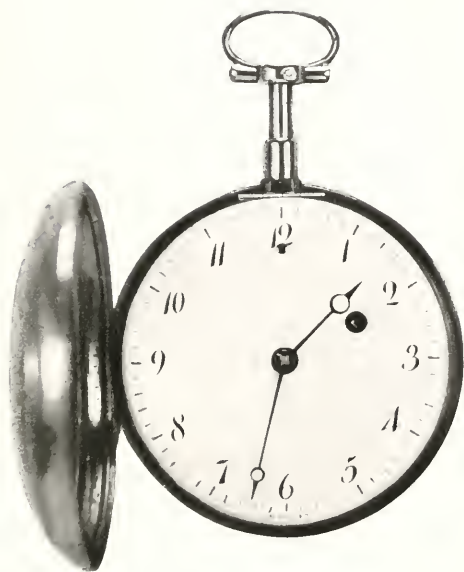


*No. 64.*

*Watch No. 4004.*

Back showing two winding holes.





*No. 65.*

*Watch No. 179.*

Comte d'Artois' Watch, given to him by  
Marie-Antoinette. He was subsequently  
Charles X.







No. 66.

Watch No. 4112.

Left dial—Solar time. Right dial—Mean time.



No. 66.

Watch No. 4112.

Works at back, covered by a crystal.  
Cam at centre for solar time.

SOLAR AND MEAN TIME WATCH.





No. 66.

Watch No. 4112.

WORKS UNDER DIAL.

SOLAR AND MEAN TIME WATCH.



*No. 67.**Watch No. 2520.*





*No. 68.*

*Watch No. 2550.*







*No. 69.*

*Watch No. 3260.*

FRONT (Open).



*No. 69.*

*Watch No. 3260.*

WORKS AT BACK.





No. 70.

Watch No. 1860.

FRONT.



No. 70.

Watch No. 1860.

BACK.

CLOCK-WATCH.

Queen of Spain's Watch.

N.B.—In this Watch the hour hand passes from hour to hour by four jumps, one at each quarter. When setting the hands to time, the striking must be set at "silent."



*No. 71.**Watch No. 1022.**No. 71.**Watch No. 1022.*

Watch out of case and its case.



*No. 72.**Watch No. 2890.*







No. 73.

Watch No. 1078.

Scale with hand (near III) is a thermometer.

Very thin "Perpetuelle" Watch.





*No. 74.*

*Watch No. 4551.*





No. 75.

Watch No. 1999.

"SOL SCRIPTIO" WATCH.





No. 76.

Watch No. 2718.

"PERPETUELLE" WATCH.







No. 77.

Watch No. 4270.





No. 78.

Watch No. 4642.





*No. 79.*

FRONT.

*Watch No. 2183.*



*No. 79.*

WORKS AT BACK.

*Watch No. 2183.*

Curb compensation and parachute are seen.





No. 80.

Watch No. 2176.







No. 81.

Watch No. 2571.

“TOURBILLON.”





No. 82.

FRONT.

Watch No. 194.



No. 82.

Watch No. 194.

Weight, two barrels and locking place in lever can be seen.

"PERPETUELLE" WATCH.





No. 83.

Watch No. 852.

FRONT VIEW.



No. 83.

Watch No. 852.

BACK VIEW.





No. 84.

Watch No. 299S.

FRONT.



No. 84.

Watch No. 299S.

WORKS AT BACK.







No. 85. *Watch No. 4255.*  
FRONT.



No. 85. *Watch No. 4255.*  
BACK.  
CLOCK WATCH.





No. 86.

Watch No. 647.

FRONT.



No. 86.

Watch No. 647.

WORKS UNDER DIAL.

CLOCK WATCH.





Watch by Mugnier. No. 860.  
FRONT.



Watch by Mugnier. No. 860.  
WORKS AT BACK.

Watch by Breguet's pupil, showing how close is the resemblance to Watches made at Breguet's Factory.





FRONT.



WORKS AT BACK.

Weight is shown.

Old Vienna self-winding Watch,  
made earlier than Breguet's  
time.

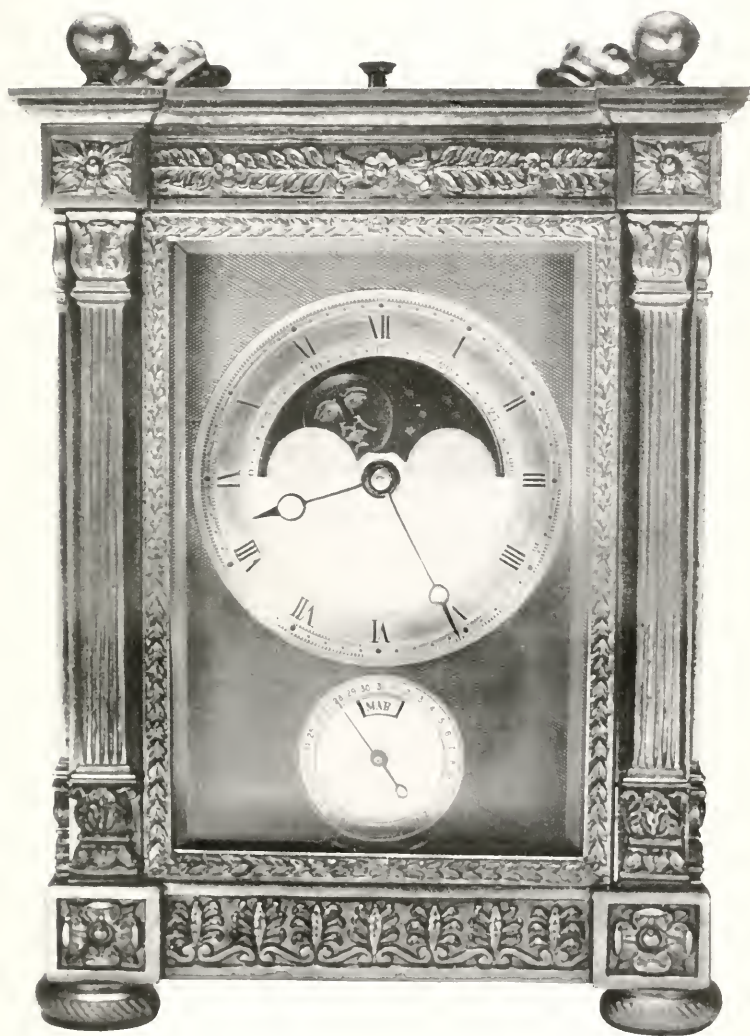






Watch showing a modern attempt to produce a self-winder, which answers the purpose and is simpler than the Breguet type.



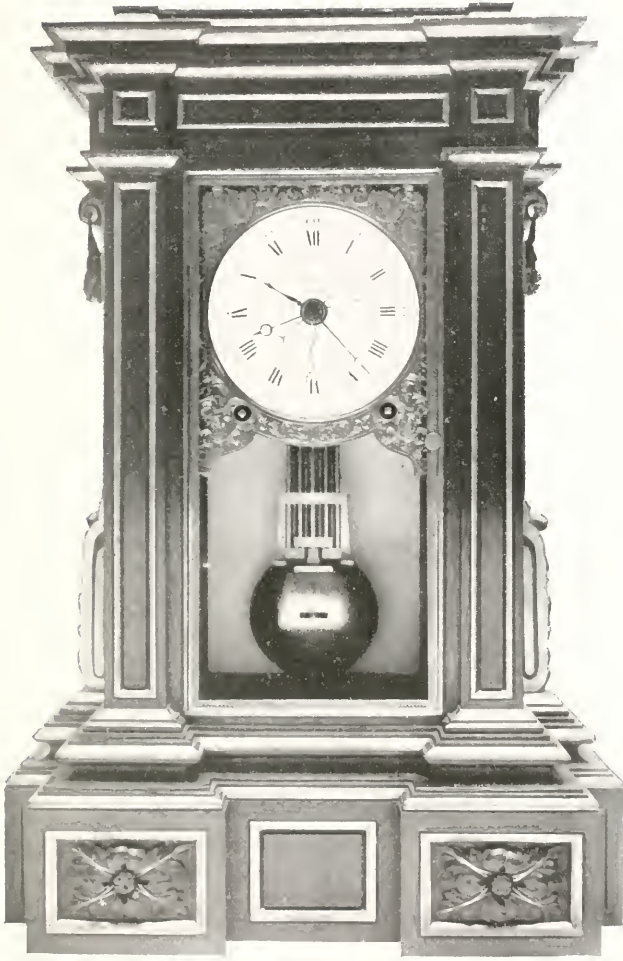


*Stock No. 1.*

*Number effaced.*

(16 cm. high, 12.5 cm. wide, 9 cm. deep).



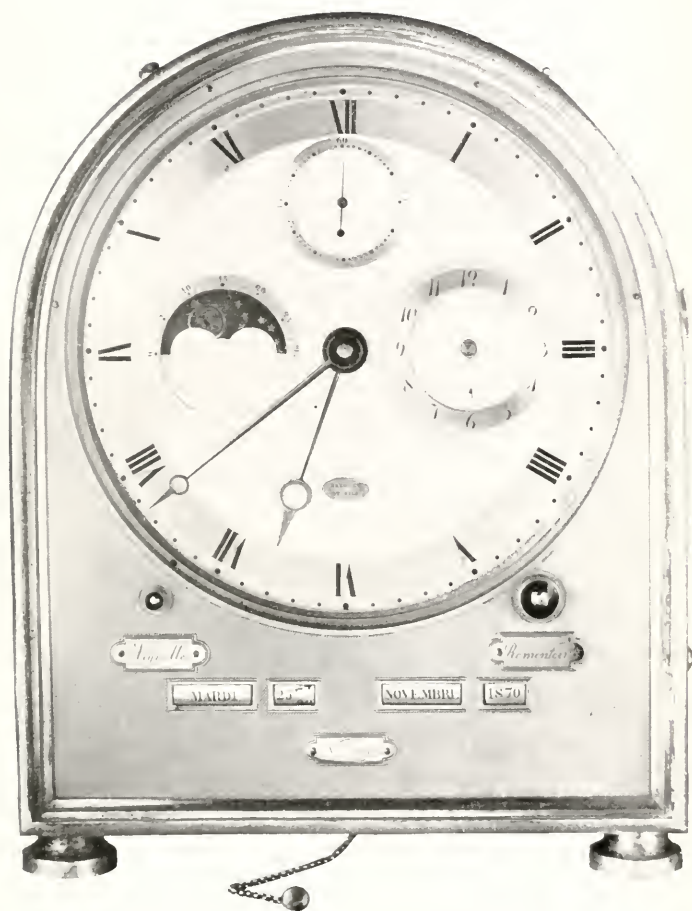


*Clock No. 2.*

*No. 739.*

26 cm. high, 37 cm. wide at base, 24 cm. deep at base).





*Clock No. 3.*

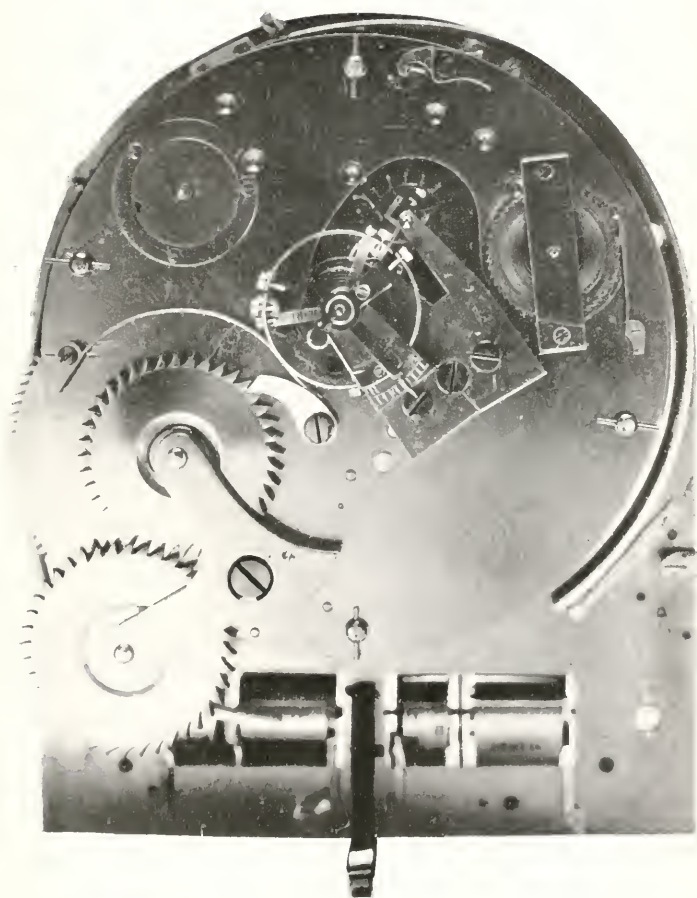
*N. 2793.*

SILVER CASE.

(15.5 cm. high, 12 cm. wide, 6 cm. deep.)







*Class No. 3.*

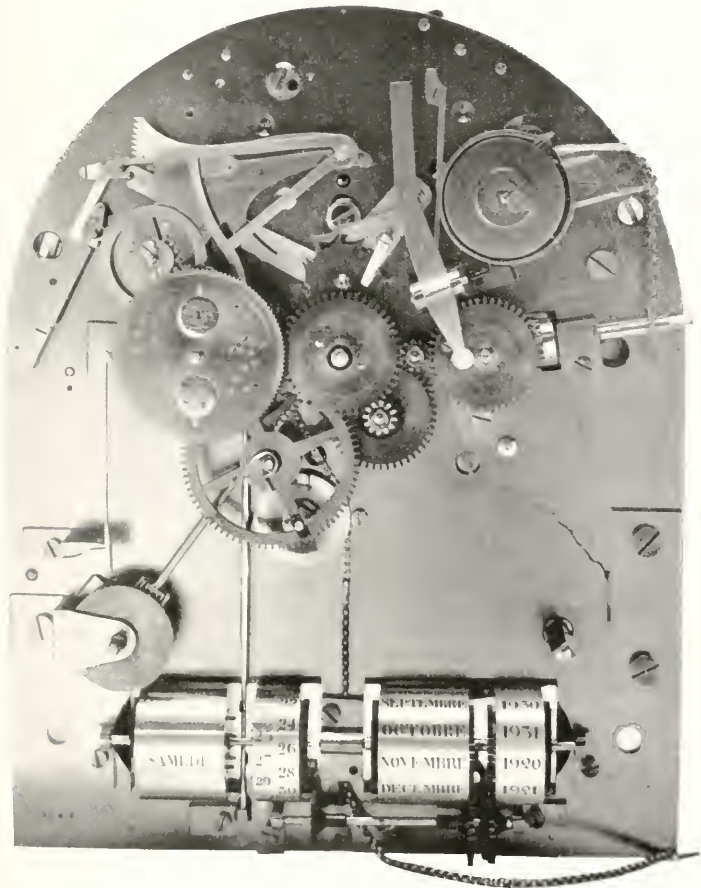
BACK VIEW OF WORKS.

*No. 2703.*

Lower ratchet wheel at left to enable winding hole to be placed below dial.

(Reduced).





*Clock No. 3.*

WORKS UNDER DIAL.

*No. 2793.*

At lower right side is seen the crack in the plate and the repair.

(Reduced).





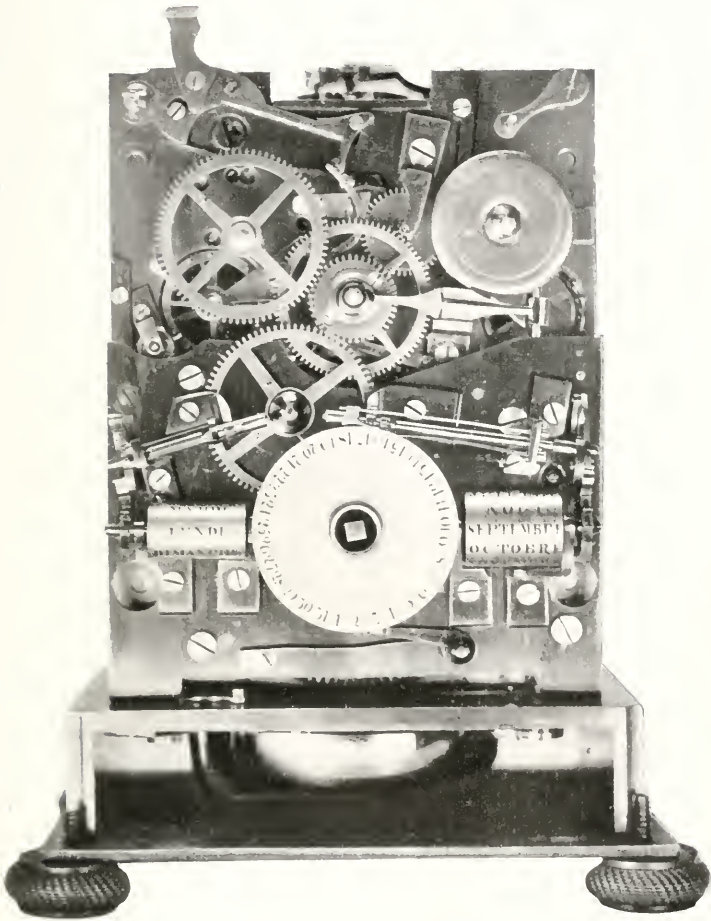
*Clock No. 4.*

*No. 3135.*

Only one barrel for going and striking movements.

(14.5 cm. high, 10.5 cm. wide, 7.5 cm. deep).





*Clock No. 4.*

WORKS UNDER DIAL.

*No. 3135.*

(Reduced).





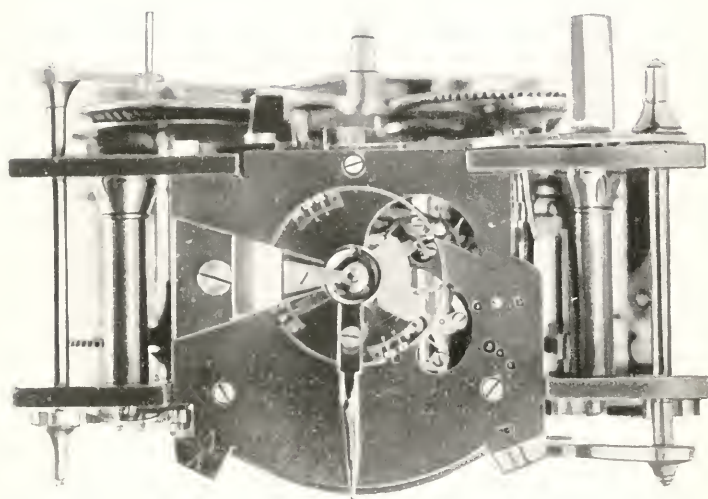


*Clock No. 4.*

WORKS AT BACK.  
 Striking movement.  
 Bell in base.  
 (Reduced).

*No. 3135.*



*Clock No. 4.*

Escapement seen from top.

*No. 3135.*

The balance shows Breguet's favourite type with no screws projecting beyond rim, and the wheel very thin.

(Actual size).





*Clock No. 5, by Rabi. Watch by Breguet, No. 722.*

“PENDLE SYMPATHIQUE.”

Watch in position.

*No. 722. In Collection No. 87.*

(10.5 cm. high, 13 cm. wide, 12 cm. deep).





*Clock No. 5, by Rabi.*

*Watch by Breguet, No. 722.*

BACK VIEW.

“PENDLE SYMPATHIQUE.”

Watch case turned back to take watch out.  
(10.5 cm. high, 13 cm. wide, 12 cm. deep).



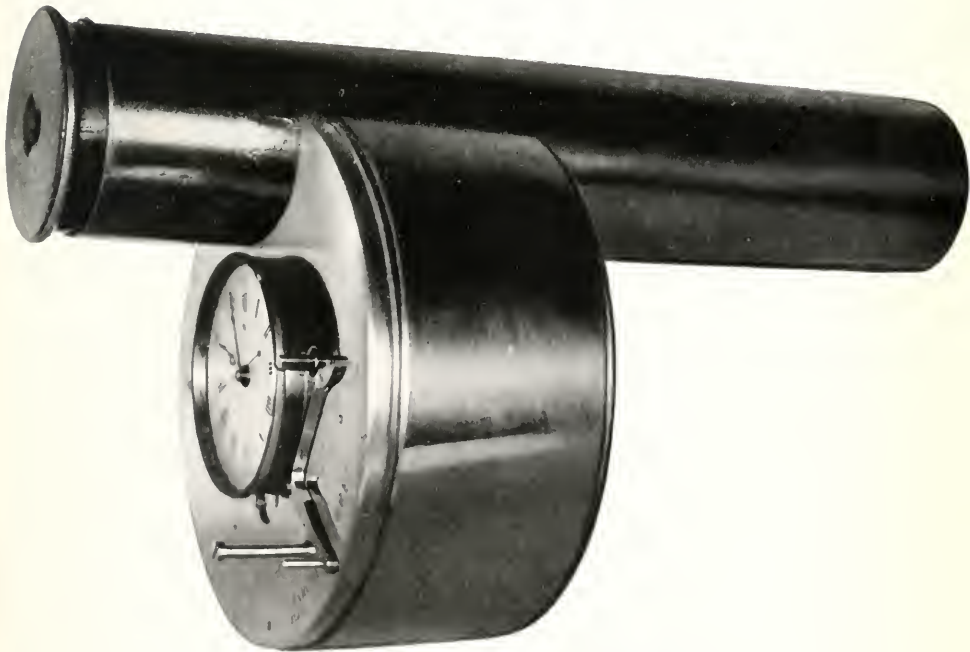




No. 6.

FRONT VIEW.

Watch No. 3165.



No. 6.

PERSPECTIVE VIEW.

Watch No. 3165.

Eye piece for telescope for transit observations.

(Actual size).











ADDENDA.





## ADDENDA.

### No. 88.

*Certificate No.* 2537.

*Watch No.* 5050.

Sold to Mr. Rebut (fils), 1st October, 1834.

“Perpetuelle” watch, very flat, gold case, engine-turned, and the original chain. Half-quarter repeater by slide. Days of the month. Phases of the Moon. Silver engine-turned dial, seconds dial, steel hands. The amount of main-spring wound is shown on dial, also regulator. Lever escapement, compensated balance, two barrels, all holes jewelled, also sapphire rollers at ends of weight limiting springs and on weight. Straight spring parachutes. The hour hand jumps hour to hour. Secret signature on dial.

N.B.—Very few thin “Perpetuelle” watches were made by Breguet, and to make these with complications is a very difficult matter. This watch is in perfect condition and beautifully made. It has an exceptional interest for a watchmaker, because of the departure from normal design.

This watch is in as good condition as the day it was made, though it has been used the greater part of its existence. All pivots are cones, and not true pivots. Therefore, virtually, the friction is merely that of the cone points upon the stones. A large number of Breguet’s watches are made thus, and in nearly every case it is so with the balance staff, as already referred to. The advantage is great; there is no pivot to break, oiling is required less frequently, and the friction is reduced. In fact, a Breguet watch, 100 years old or more, which has been carefully used, may be examined with a magnifier, and scarcely any trace of wear is observable. Such watches may last almost indefinitely without deterioration.

In this watch, the repeater gong is lodged between the plates and not visible, a rare construction. The lever escapement is of the “straight line” type. The weight, which is of platinum, works in a space between the plates, the latter being cut away for the purpose, instead of being placed above one of the plates



which is usual in the "Perpetuelle" watches. When the back and dial are off, the weight appears to work in a "window" in the mechanism. This weight has three sapphire rollers to take off any possible side friction, should this arise, and each roller is made beer-barrel shape so as to run only on a line and not on the whole face of the roller, thus greatly reducing any friction when in action. Breguet always used rollers of this type, when found in a watch, except for the limiting springs.

The general design is remarkable and the workmanship excellent. For the thinness and size of the watch, to obtain so many complications would appear hardly possible, and can only be realised after examining the works. A gentleman who has made a study of Breguet's watches and his other productions for 40 years has never come across a similar watch, so it may be unique, though this word is hardly correct for Breguet, since every fine watch by him is unique, but the one here in question departs in almost every particular from the beaten track.

NOTICE.—To take off back, three screws on edge of body must be removed, *also* one at pendant. The head of latter screw is on the front at pendant. The back snaps on, besides being held by the four screws. When replacing the back, care is required to enter the three little "feet" in the corresponding three holes in the body.

#### No. 89.

*Certificate has no number.*

*Watch No. 4308.*

Delivered to Messrs. Rundell Bridge and Rundell for King George IV., 27th May, 1827, for £380 sterling.

The Certificate was made later, viz.: 22nd June, 1831.

Savonette gold watch, engine-turned. Watch removes completely from the outer case and is engine-turned. Since the backs of Breguet's watches are snapped in and permit of a glass being put in, advantage has been here taken of this, and the front gold plate has been replaced by a glass, but the gold part has been preserved and may be put on again at any time. If this outer case is accidentally closed when the watch is out of it, the case can be opened with a needle passed through a hole near the pendant place.



The description of the watch is : As above for the case, half-quarter repeater, can only be repeated when not in its case ; à tact, this is used when watch is in the outer case. Complete calendar, equation of time shown on dial, seconds dial, regulator on dial. Dial silver engine-turned, hour and minute hands gold, the others steel. Barrel arbor pierced. A crest has been engraved on the front dome of case in centre. Lever escapement, compensated balance, ruby holes. Certificate states "ouvrage de première classe." The watch is in condition as new. The hour hand jumps hour to hour.

**No. 90.**

*Certificate has no number.*

*Watch No. 1 of Series 2.*

Sold to M. Ferey du Havre, 21st October, 1819, for 4000 francs.

On the movement is engraved "Par Breguet pour  
Mr. l'Ambassadeur Prince Kourakin."

Gold case, enamelled dial, seconds dial, centre seconds, equation of time. Calendar, the hand shewing date springs to zero end of each month. Fusee, chronometer escapement, compensated balance. Was sold in a wooden case and not a morocco-covered one, as was usual with Breguet. This watch is in condition as new, and partly made by Abraham-Louis Breguet himself.

N.B.—The above description is given from particulars sent by Mr. Henry Brown, of Breguet's Firm at Paris, to whom this watch belongs, and from the photographs which accompanied it.

The watch is very interesting since there are many departures from the usual practice. The "months ring" turns, not upon a centre, but guided by sapphire rollers at several points. This method is sometimes found in clocks, but never in watches, since, if special care is not taken, there is undue friction. The equation of time cam is also worked without a centre, and the curve is internal instead of external. There are also many other points of interest in this watch. It may be concluded from the number of the watch that Series 2 started about 1817 or 1818.

NOTE.—If time had permitted, this watch would have been described from the timepiece itself, as is the case of every other watch in this book, but to have waited to do this, would have made the description too late for inclusion in the present volume, which at the time was in the press.



**No. 91.***Certificate No. 234S.**Watch No. 148.*

Sold to the Duc de Praslin, 20th December, 1791, for 4000 francs.

Gold engine-turned case, "Perpetuelle" watch, minute repeater, independant centre seconds, stop watch. Enamel dial with secret signature, seconds dial, steel hands. The amount main spring is wound shown on dial. Chronometer escapement, compensated balance, ruby and sapphire jewels. The balance is of peculiar construction. On back the letter "P" in centre. The watch is in first-class condition.

N.B.—This watch is the property of Lieut.-Colonel Edward Bryce, D.S.O.

NOTE.—On reference to page 32, No. 6, it will be seen that a "Perpetuelle" watch was sold to the Duc de Praslin about the same date, viz., 1792, and for the same price, viz., 4000 francs, and with same watch number, viz., 148. The two watches are quite dissimilar, and each has a Certificate which differs.







No. 88. Watch No. 5050.  
FRONT.



No. 88. Watch No. 5050.  
WORKS UNDER DIAL.

THIS "PERPETUELLE" WATCH.





*Vol. 88. Watch No. 5050.*

WORKS SEEN AT BACK.

THIS "PERPETUELLE" WATCH.





No. 89.

Watch No. 4308.

FRONT.



No. 89.

Watch No. 4308.

WORKS UNDER DIAL.

Watch of George IV.





No. 89. *Watch No. 4308.*  
WORKS SEEN AT BACK.



No. 89. *Watch No. 4308.*  
BACK SHOWING TACT.  
Watch of George IV.







No. 90. *Watch No. 1 of Series 2.*  
FRONT.



No. 90. *Watch No. 1 of Series 2.*  
WORKS UNDER DIAL.

Watch partly made by A. L. Breguet himself.





No. 91.

Watch No. 14S.

FRONT.



No. 91.

Watch No. 14S.

WORKS UNDER DIAL.

"PERPETUELLE" WATCH.





No. 91.

Watch No. 14S.

WORKS SEEN AT BACK.

“PERPETUELLE” WATCH.









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