FINAL VERSION TO CORRECT

## The Fairbridge Chapel Turret Clock



## Introduction

Some years ago the Chapel Society issued a four-page paper about the old turret clock in the Fairbridge Chapel. This has been included on our web site. Since that paper was written in 2006 additional information about our Gillett \& Bland clock has surfaced. This includes newspaper articles published in the Victoria Daily Colonist, a more complete history of the Gillett \& Bland/Gillett \& Johnston Company and the history of other old turret clocks throughout Canada.

Also, it was felt that some readers may be interested in knowing a little more about how the keeping of time evolved throughout the ages, a few of the important advances in manufacturing timepieces and to a lesser extent bells. The appendix contains specific data about the Fairbridge Chapel turret clock, a definition section and a partial list of a few famous clocks, bells and carillons made by Gillett \& Johnston both in Canada and elsewhere in the world.

From the research undertaken to date it is believed the Fairbridge Chapel turret clock is one of the oldest functioning clocks existing in Canada and one of the few historic clocks still wound by hand. We would appreciate knowing more about the of other century plus turret clocks existing in Canada, some which are mentioned as well as others not included. Our Society can be contacted through our web site e-mail address listed at the end of the paper.

Ron Smith
Fairbridge Chapel Heritage
Society, 2012

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The Measurement of Time

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Nature's clock is the sun, so an early name
for the mechanical timekeeper was the
'artificial clock'. This neatly pinpoints the
function of any timepiece: to imitate the
apparent daily passage of the sun.
    Clocks & Watches-1400-1900
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From the very beginning of civilization people have wanted to find ways to measure time. Cavemen were the first. They followed the movement of the sun and moon and tried to determine the changing of seasons. Possibly the 30,000-year-old bone found in the Dordogne region of south western France may have been the earliest attempt discovered to date. This was a simple bone with grooves notched on it and seems to correspond with the moon's travel through the sky over a number of months.

Thousands of years passed before people began to measure time more precisely-first in months, weeks, days and then into hours, minutes and seconds. Now, with the atomic clock, man can keep extremely accurate time down to the trillionths of a second over a very long period of time.

The Egyptians were the next people to advance the keeping of time. By putting a post in the ground they noticed that the shadow cast by the post changed both in length and direction as the sun moved through the sky. "By 3500 B.C. the Egyptians had constructed elaborate obelisks whose moving shadows broke the day into two parts, divided by noon. Two thousand years later, the obelisk had evolved into the small sundial, or shadow clock; for millennia it remained the most advanced devise for dividing days into hours." ${ }^{1}$ Of course there was a major drawback to the sundial; it just didn't "tell time" at night and on cloudy days. Also, as "the length of a day varied everywhere, sundial time varied everywhere, too." ${ }^{2}$

Water clocks were the next invention devised to measure time-even at night and at different locations. Again it was the Egyptians who determined that by controlling the flow of water dripping from the bottom of one bowl into another bowl which had a series of lines marked on the lower bowl one could determine the time of both day and night. There was only one drawback to the water clock-it didn't work at all when the water froze. It should mention that the Egyptians were not the only people measuring time by using water. The Chinese emperor had the "Heavenly Clockwork" built by a civil servant named Su Sung in AD 1090. ${ }^{3}$

Next came the hourglass, or sandglass that measured short intervals of time. They are used to this day for boiling eggs or beating a cake mix, for example. The hourglass was invented after man learned how to produce clear glass.

## The Early Mechanical Clocks

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Time is one of the three fundamental quantities
    on which all physical science is based and its
        measurement has been the concern of every
            developing civilization.
                            Clocks & Watches-1400-1900
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The word 'clock' comes from the French word cloche and Teutonic (German) word glocke, meaning bell. Thus, if we were to use the correct terminology we should use the term 'timepiece' for the mechanical devise that tells the time only and the word 'clock' for the alarm whether it is a bell, whistle, horn or siren. In the past monks and others living around the many monastery settlements throughout Europe "used the Latin word horologium for all kinds of timekeepers-clocks, sundials, water clocks, and sand glasses-which has confused the history of the mechanical clock." ${ }^{5}$

It is unknown who or exactly when the first mechanical clocks were invented but by the 1300's they were found in monastery towers and other prominent buildings across Europe. In the fourteenth century Italians were having clocks placed in the centre of communities as a symbol of a strong, stable and important regional city or town. Also, a mechanical clock is said to have been built by the Augustinian Canons of Dunstable Priory, Bedfordshire in 1283 and would predate other recorded clocks by several decades. ${ }^{4}$

The measurement of time was not the same around the world. In Italy, for example, clocks had both 12 -hour and 24 -hour dials and measured in what was termed the Italian hours which started at sunset (or about half an hour after dusk) and ran until the next sunset. Because the clocks with twelve segments seemed confusing many were switched to show 24 hours on the dials. The famous Milan clock (1335) which was probably the first clock to strike the hours, (e.g. 4 strikes of a bell for 4 o'clock) instead of one blow at the hour, struck from 1 to 24.

In Siam (Thailand) the measurement of time was kept in four segments, or counts, starting at sun rise and running to when the sun was at its highest point, about 6 hours later, then to nightfall and darkness which was approximately six hours later. The measurement of time during the period the night mattered little in this largely agrarian nation. This method of keeping time, dawn to dusk, dusk to dawn segments, could be found in many other countries in eastern Asia including China and Japan. However, in Japan "hours had always been counted backwards, beginning at nine. This number indicated both midnight and midday, and as there were only six periods or hours to be counted, hourly progression was shown as $9 \ldots 8 \ldots 7 \ldots 6 \ldots 5 \ldots 4$. At the half hours following odd hours a single stroke was sounded, and at the alternate half hour, two strokes. The countwheel of a Japanese stroking clock was therefore normally cut to give successively $9 \ldots 1 \ldots 8 . . .2 \ldots 7 \ldots 1$ etc. strokes." ${ }^{6}$

Nuremberg made the old temporal hours ${ }^{7}$ of equal length, but had two counts, one from dawn and the other from dusk. Basle, on the other hand, started their day at midday instead of dawn and called it one o'clock. England broke their day into two sets of 12 equal hours, noon and midnight which most of Europe adopted before the fifteenth century.

Very early clocks didn't have an outside face thus any hour or minute hands. Furthermore, the bell wasn't connected to the mechanism but rather a clock-keeper had to ring or 'strike' it at the appropriate hour. As it was often found that a man, whose duty it was to strike the bell both day and night, could not always be relied on to perform this task, many communities decided to purchase a system with a "mechanical man" to strike the bell. These "robot figures operated by the clocks were
usually made of wood and painted to look like men-at-arms, perhaps because they always obeyed orders. They were called Jacomarts, which today had become contracted to 'clock jacks'." ${ }^{8}$

All of these old clocks, except the one in Salisbury Cathedral (with some modifications), no longer exist. The Salisbury Cathedral clock was made in 1386 and was neglected in the tower for many years. This is the oldest tower clock still functioning and only struck the hours. In 1931 it was cleaned and put on display. "In 1956 a reproduction of its original verge and foliot escapement was fitted instead of the pendulum to which it had been converted in its later history." ${ }^{9}$ It is recorded that a man named Reginald Glover was required to take care of the clock in 1386 as part of a legal contract. ${ }^{10}$

## Advancements after the $14{ }^{\text {th }}$ Century



Skilled craftsman began working on manufacturing smaller clocks that were both more accurate and reliable. But this proved to be a challenge. For example, the spring-driven clocks, which appeared in the $15^{\text {th }}$ century, created one such problem, namely, how to keep the clock functioning at a constant rate as the spring ran down. European craftsmen found that by using an escapement to govern the speed the coiled spring unwinds resulting in the hands of a timepiece moving "just as efficiently as the weights of a tower clock." ${ }^{11}$ This achievement eventually leads to the manufacture of 'portable clocks', namely watches.

As mentioned early clocks did not have a dial or any hands to display the time on the outside of a tower. Rather the clock mechanism was all within the tower beside the bell which would be struck at the appropriate time by the jack. This all changed around the $15^{\text {th }}$-century when some towers had a dial and an hour hand on its exterior so people could view it as some distance. The tower of St. Michael's Church in Coningsby, Lincolnshire is one of the last one-handed church clocks still operating in England. Installed sometime in the $17^{\text {th }}$ century it has a single clock dial painted on one side of the tower measuring over five metres in diameter and the hand is almost three metres long. ${ }^{12}$

By the middle of the next century clockmakers began making clocks that included a minute and even a second hand. "An early record of a second hand on a clock dates back to about 1560. However, this clock could not have been accurate, and the second hand was probably for indicating that the clock was working." ${ }^{13}$

About 100 years later, in 1656 to be exact, the next important advancement in clock development took place. Up until then clocks could not accurately measure short intervals of time. It was in that year Dutch astronomer and mathematician Christiann Huygens is credited with inventing the first pendulum clock which was actually manufactured by clockmaker Salomon Coster. This 'new' clock was based on the principal Galileo had discovered in 1582: namely, that a pendulum swings at a constant rate, was a real advancement for keeping time since these clocks now had an error of less than one minute per day. Huygens used short pendulums that beat several times a second. ${ }^{14}$ Up until then it was not unusual for a clock to lose over 15 minutes each day. Within a few years Huygens made
more improvements and had reduced his clock's errors to 10 seconds or less a day. In 1670 English clockmaker, William Clement, made a much longer pendulum and it took a full second to move back and forth thus allowing for greater accuracy. Putting the pendulum and weights in a wood compartment to lessen the effects of air currents, this clock was small enough to hang on a wall or be enclosed in a wooded clock stand—thus the "grandfather clock" was born. ${ }^{15}$

The greatest advancements in clock manufacturing were being made in Europe, especially by French clockmakers. However, in 1685, under the reign of King Louis XIV, the Edict of Nantes, which gave Protestants protection against political persecution, was revoked. This resulted in many skilled clockmakers, amongst others, leaving France for London and Geneva.
"The balance of power was now titled in favour of England and Switzerland. The effect was at first greatest in England, where the growth of clockmaking and watchmaking coincided with, indeed was part of the scientific revolution...A stream of fundamental inventions resulted, and before 1700 London became the clockmaking and watchmaking centre of the world." ${ }^{16}$

It did not take long, only about 50 years, before clocks and watches were being manufactured throughout the British Isles. It became very fashionable for the rich to have a watch in his waistcoat pocket instead of one tied from a belt. With the demand for both small personal watches and large turret clocks for churches and other prominent town or city buildings two things happened-both improving the accuracy of keeping time. Clockmakers first continued to experiment with the length of the pendulum as well as the types and combination of metals used in the bob (the weight at the end of the pendulum). They also worked to increase the efficiency of the escapement.

It was found that by lengthening the pendulum the longer it would take to swing from one side to the other. If a pendulum took 2 seconds this resulted in better timekeeping and by using different metal such as a combination of brass and steel rods, pendulums were less susceptible to temperature changes and further advanced the clock's accuracy.

The anchor escapement had resulted in clocks being accurate $\pm 10$ seconds a day but it was the work of George Graham, a clockmaker and designer of scientific instruments, who invented an even more accurate way of keeping time with the dead-beat escapement in 1715 . For about the next 150 years Graham's dead-beat remained the ultimate in escapement for the best pendulum clocks. ${ }^{17}$

There were others who worked to further improve the escapement mechanism during the next fifty years. In about 1760 a number of British clockmakers tried to develop a gravity escapement. The idea was to "apply the impulse of the pendulum by a weighted lever instead of by a tooth of the escape wheel." ${ }^{18}$ It was over 90 years later-in 1852 to be exact-that E.B. Denison, a lawyer and amateur clockmaker, succeeded in making the first successful gravity escapement.

It had also been decided by the English government to include a clock tower to the new British parliament buildings and in 1846 a competition was announced asking for clockmakers to submit proposals for the clock. "The Astronomer Royal, Sir George Airy, was appointed referee and set out high standards for the clock to meet. These included: -the first stroke of each hour to be accurate to within one second;
-the clock performance to be telegraphed twice a day to Greenwich Observatory" ${ }^{19}$

Airy appointed E.B. Denison to assist him in selecting the winner and on February 1852 E.J. Dent was appointed to build the clock to Denison's own design. Unfortunately there were problems along the way. E.J. Dent died in March 1853, and then the proposed clock tower was found to be too small for the clock and needed to be altered, which delayed the completion of the project. The clock was
finished by Frederick Dent, E.J.'s son, and put in storage. It should be mentioned that E.J. Dent had started to develop a flatbed style tower clock and his Great Exhibition Clock "which was almost certainly his first, made for the Fredericton cathedral in New Brunswick, Canada." ${ }^{20}$ The clock was finally installed in the Palace of Westminster in April 1859 and the flatbed clock included Denison's double three-legged gravity escapement. "This was a revolutionary mechanism, ensuring the clock's accuracy by making sure its pendulum was unaffected by external factors, such as wind pressure on the clock's hands. ${ }^{121}$ The clock began keeping time on May $31^{\text {st }}, 1859$ and soon after the chimes of the Great Bell—or Big Ben joined in.

Finally, just as there were very important inventions and changes made with the pendulum and escapement during the $18^{\text {th }}$ and $19^{\text {th }}$ centuries, likewise there were changes made to the design of some tower clocks. As mentioned the clock in the U.K. Parliament tower is a flat bed design. This differed from other tower clocks made up to that point in time. The frame was made of cast iron with all the mechanism bolted directly onto a horizontal flat frame which meant "it was much easier to manufacture, to assemble and to service the clock movement. Timekeeping improved to a second or so in a week, a great performance for such a great clock." ${ }^{22}$

Soon after this type of tower clock was invented, and proved very successful, a number of British clock companies began to produce flat bet clocks including Gillett and Bland of Croydon, the makers of the Fairbridge Chapel Tower Clock. Not only were the clocks now being made just for important buildings throughout the British Isles but were being exported around the world.


Sharnbrook Clock—c168o
Wooden Framed Turret Clock

## Turret Clocks \& Public Clocks in Canada



A clock tower is one of the most recognizable landmarks of any community large or small and there are thousands in almost every corner of the world. In the past, the clock, whether atop a tower on a religious building, town hall or post office provided an important service by making the time known publicly. It was accomplished by the striking of a bell, or a number of bells, or by displaying the time on a large external dial near the top of the tower.

By far the largest concentration of public clocks including those in towers are located in Europe, including the British Isles. After all, this is where the majority of the advances in perfecting the accuracy of timepieces had occurred during the past one-thousand years. With Europeans exploring and colonizing North and South America, Africa and much of Asia after about 1500 the advances in technology, which included the manufacturing of clocks and bells, also spread around the world.

The oldest functioning public clock in North America is located in Old Montreal. A gift of King Louis XIV of France for the St. Sulpice Seminary it began keeping time in 1701. The seigneurs of the Island of Montreal resided in the building, now a National Historic Site, for over two centuries. ${ }^{23}$ The clock could well have been made by Isaac II Thuret (1630-1706) clockmaker to the French king.

Europe, being just across the Atlantic from the east coast of North America only a few firms, exclusively in the United States, began manufacturing large turret clocks during the 1800's. For Canada this meant that almost all clocks of this nature were either manufactured in the eastern United States or England.

By the mid-1800's a number of eastern Canadian cities were becoming important economic and political centres and as they grew large new buildings were constructed such as churches, court house and railway stations. Many were adorned with tall steeples or clock towers. In 1881 Thomas Fuller (1823-1898) was appointed Dominion chief architect and supervised the design of over 140 buildings across the country of which 78 were federal buildings or post offices. "His small post offices, executed in a blend of Gothic and Romanesque forms and characterized by their picturesque massing, and accented by stone gables and tall clock towers provided immediate recognized symbols of the federal government and established a design that endured into the 1930's" ${ }^{24}$ All Post Offices/Custom House were prominently located in the centre of the community, usually on the most important street. They were of various sizes depending on the size and importance of the community and built using local materials whenever possible. "This formal resemblance (to the Parliament Buildings in Ottawa) strengthened the symbolic aspect of the government's presence throughout the country. Moreover, time was very much on the minds of Canadians. Sandford Fleming had introduced the concept of standard time as early as 1884. Telling the time from the post office tower would become
an integral part of the daily lives of Canadians, a basic of life often taken for granted, much like the church bells of yore." ${ }^{25}$

Over the past fifty years the federal government disposed many of them. Some were demolished while others were acquired by the local community and are now used for other governmental or cultural purposes. One example is the Duncan post office, built in 1913-14, and acquired by the City of Duncan in November, 1975. The large building was totally refurbished maintaining the historic integrity inside and out and is now their landmark city hall. The large turret clock, made by J. Smith \& Son, Midland Clock Works, Derby, England, can still be heard throughout the core of the city, just as it did for the first time at the stroke of midnight bringing in the new year-1915.

Today the remaining clock towers are largely found as part of churches, government buildings, and at educational institutions. Also there are a few memorial clock towers. In the past they were also found at major railway stations and seaport passenger piers. Public clocks, or town clocks as they were often called, used to be found at street level or above the entrance to an important business such as a bank or jewellery store and factories. Some of these examples exist today but often supplanted by clocks at a new commercial mall or erected by a local organization to commemorate an historic event or individual. The Rotary Clubs have erected many beautiful town clocks now found in parks or along the streets of Canadian towns and cities commemorating their 100 years service to the particular community.

Today there are only about a dozen clock towers throughout Canada having a functioning old turret clock-one manufactured prior to 1880-and some of them are now wound with the assistance of an electric motor. As mentioned Saint Sulpice Seminary has the oldest church clock on the continent predating the next oldest working timepiece in Canada by over 100 years. The few other known turret clocks of this era are found at the following locations.

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-Halifax Town Clock, 1803
-Victoria Hall, Cobourg Ontario, 1859
-Market House/City Hall, Belleville, 1873
-Perth Town Hall, }187
-Cathedral Church of St. James, Toronto, Ontario, 1875
-Prince of Wales Fairbridge Farm School Chapel, Cowichan Station, B.C. }187
-Cardno Block, Seaforth, Ontario, }187
-Fredericton City Hall, Fredericton, New Brunswick, 1878
-Former Lincoln County Courthouse, St. Catharines, Ontario, exact date unknown
-St Lawrence Market, 1850's, exact date unknown
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Halifax Town Clock is located at the base of Citadel Hill and began keeping time on October 20, 1803. Now also a National Historic Site and maintained by Parks Canada the clock was manufactured by the House of Vulliarny, London. Prince Edward, Duke of Kent, who was stationed with the army in Halifax at the time, commissioned the turret clock for the garrison before he returned to England in 1800. The hammer strikes the bell on the hour and quarter hour while the two clock and one bell trains are now wound twice a week. ${ }^{26}$

Victoria Hall in Cobourg Ontario was constructed in 1857-1859. On December $28^{\text {th }}, 1859$ it was reported "the cost of the clock and bell for the new town hall was just 278 Pounds Sterling, which amounts to about $1 / 100^{\text {th }}$ of the cost of the building," and on February $24^{\text {th }}, 1862$ there is mention that the "Cobourg Town Trust gave Council permission to have the town bell rung three times daily." However, it does not look like the clock had any exterior dials until almost the end of the century as on September $14^{\text {th }}, 1899$ it is mentioned, "Thomas Gillbard, Chairman of Cobourg Town Trust thanks Mrs. Crawford for donating funds for the purchase of illuminated dials for the Victoria Hall clock." ${ }^{27}$ There is
a good possibility the clock was purchased from an English manufacturer as it is not listed as one of the early clocks supplied by the main U.S clock makers.

The Market House and now the City Hall for Belleville was constructed in 1872 and 1873 featuring a 44 metre tall clock tower. The clock and bell were purchased in 1873 from the E. Howard \& Co. of Boston and has four large illuminated clock faces. ${ }^{28}$

The Cathedral Church of St. James clock was manufactured by J.W. Benson \& Co., London in 1862 and won prizes at the International Expositions in London in 1862, Paris in 1867 and Vienna in 1873. It was installed in the tower once the steeple was finished in 1875 and became operational with the dials illuminated on the evening of December 24, 1875. An electric motor is now used for winding the clock mechanism. ${ }^{29}$

The Perth Town Hall, built in 1863 to 1864 also was used for more than just local government offices. It included a concert hall, police station, post office and an area for a farm market. The clock tower was added in 1870 while the clock was purchased from E. Howard \& Co. in 1873 and installed in $1874 .{ }^{30}$

The Prince of Wales Fairbridge Farm School Chapel clock was manufactured by Gillett and Bland of Croydon, England in 1875 and was initially the first town clock in the City of Victoria having been purchased by C.E. Redfern, a prominent jeweller, during a trip to England. Arriving in June, 1876, the 'Victorian' two train turret clock began keeping time and striking out the hours the following month. In the spring of 1940 it was installed in the Fairbridge Chapel clock tower and has been operating ever since.

In 1876 and 1877, local Seaforth, Ontario entrepreneur Alexander Cardno constructed the large Cardno Block on the community's main street. The building had five stores at street level as well as a music and concert hall on the second floor. The E. Howard \& Co. manufactured the clock for the 20 metre tower. The grand opening of the "Opera House" was held on December 15, 1877. ${ }^{31}$

The Fredericton City Hall clock was also manufactured by Gillett and Bland and installed in the clock tower above the building's front entrance on May $1^{\text {st }}, 1878$. In 2008 the clock underwent repairs and restoration by the Balzer Family Clock Works of Freeport, Maine before returning to the city. The clock originally came with a sundial to ensure the mechanism kept pace with true sun time. It now has an automatic winding system. ${ }^{32}$

The Lincoln County Courthouse was erected in 1849 initially as the St. Catharines Town Hall. The clock is believed to have come from a European firm and is housed in a short tower clock above a smaller octagonal cupola. There is no historic information about the clock and bell except that it evidently continues to chime "with the assistance of the original weights which extend from the clock tower to the first floor." ${ }^{3}$

The original St. Lawrence Hall was constructed in 1846 and an E. Howard \& Co. clock supplied. However, the building was destroyed during the great fire of 1849 and rebuilt the following year. Again there is not a considerable amount of information about this clock and bell. It is possible that it came from the original hall. ${ }^{34}$

By the 1930's fewer and fewer government buildings, whether they were post office/custom houses or town halls were being constructed with tall clock towers. There were a number of reasons for this. First, considerably more people owned wrist watches or inexpensive pocket watches', second, by the mid-1930's the Canadian Broadcasting Corporation radio took to the air. Once a day the national time signal was broadcast, as it is today, thus Canadians who owned a radio could accurately set their clocks and watches and third, costs associated with constructing these large buildings with a tall tower that served just a single purpose no longer seemed to be necessary. Some of the post offices
built of in smaller centres never gained the status to have such an important building with a clock tower. In other cases, the Gravenhurst, Ontario facility is a good example, the post office enlarged as the population of the community and surrounding rural areas increased. In 1926 a single storey brick building was constructed on the most important business corner in the town. Nine years later, in 1935, a second floor was added along with a four-faced clock in a short tower above the main entrance. While new religious buildings built during this same period quite often included a tower they were built to hang a single bell or peal of bells and did not include a turret clock.


Seminary of Saint Sulpice, Montreal, Quebec


The Seminary Clock, 1701

# The Fairbridge Chapel Turret Clock 

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    There is nothing you can do to a good tower clock
    to improve it, and anything you do to it that is not
    exactly as original constitutes the mutilation-cum-
        destruction of a valuable public asset.
            Care of Tower Clocks
                            William R. Kennedy
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Before the turret clock, which is also often referred to as a tower clock, was installed in the Fairbridge Chapel it had kept time in Victoria for over half a century. In 1875 Charles E. Redfern, owner of the C.E. Redfern-Watchmaker \& Jeweler business made a trip back to England to acquire new watches, eyeglasses and other jewellery supplies for his business. While there, on October $10^{\text {th }}$, he placed an order with the firm of Gillett and Bland of Croydon for one of their large clocks. ${ }^{35}$

Redfern, born in London in 1839, had apprenticed with his father, a clockmaker, before evidently deciding to try his luck in the wilds of the Cariboo-the latest gold rush that gripped western North America. Arriving at Esquimalt in mid-September 1862 after a four month voyage he changed his mind deciding to remain in Victoria once he saw it was an up and coming community; one that also lacked a clockmaker. The following year he opened his business. ${ }^{36}$

Upon his return to Victoria and early in 1876, likely anticipating the arrival of his clock, Redfern bought out another jeweller and moved into the larger ground floor of the Masonic Building on Government Street. A small story appeared in the June $27^{\text {th }}$ edition of the British Colonist:

> TOWN CLOCK-Mr. C.E. Redfern received per steamer Dakota the large clock he ordered when in England and which he intends to erect in front of his store for the benefit of the public. A good reliable clock which can be seen for some distance is a thing that has been long wanted, and Mr. Redfern's importation will just supply that want. The time by the clock will not only be seen two or three blocks off, but the striking of the hour will be plainly heard a mile distant. 37

A few days later city council had given him permission to close off a section of the sidewalk in front of his premises so the big town clock could be erected. With work completed it was reported in the British Colonist of July $28^{\text {th }}$ that passers-by were now gazing up at Mr. Redfern's clock. It had cost him a 76 Pounds, including shipment. ${ }^{38}$

This remained the only town clock in the city for over fifteen years-until the new city hall clock started operating in May 1891. Mr. Redfern, who by now had served a number of years on council and one term as mayor, also ordered, assembled and maintained this new, large illuminated turret clock. Once again it was the same firm, now called Gillett and Johnston, which manufactured the clock and bell. 39

Meanwhile, after eight years in the Masonic Building Redfern built a new brick building at 43 Government Street (later renumbered as 1009) and naturally the clock went along. Four years later, on December $6^{\text {th }}$, 1888 the clock was illuminated by an electric light for the first time. It was reported that the chimes could be heard throughout the downtown area and when the wind blew off the Inner

Harbour the sound carried much further towards Oak Bay. After being located on Government Street for 50 years Redfern \& Sons moved to a new location at 1211-13 Douglas Street in 1913 and two years later were at 714 Yates Street. It is quite likely that when they made the first move their magnificent clock was removed and sold.

In 1910 Joseph Rose arrived in Victoria and in 1914 was listed as being employed as a jeweller for the firm of Little \& Taylor but a year later he had his own establishment at 1324 Douglas Street. In 1920 he had moved his business to 1013 Government Street where it remained for many years. It was about this year that Redfern's clock was acquired and once again began keeping time in the capital city. In 1938 Rose's Jewellers moved to 1317 Douglas Street and the large clock was dismantled and put in storage. ${ }^{40}$ When it became known in the fall of 1938 that a large chapel was to be built at the Prince of Wales Fairbridge Farm School near Cowichan Station about 50 kilometres north of Victoria thanks to an anonymous benefactor Joseph Rose believed it would be most fitting and the perfect new home for the old, reliable town clock.

The following story from the Victoria Times mentions the move and a little about its history to that point in time.

To the many citizens of Victoria who have set their watches and timed their daily round for years by the regular pace of the clock which hangs above 1013 Government Street, just below Fort at the old site of Rose's Jewellery Store, the feeling that they are losing an old friend has come.

The clock, the first outside timepiece to come to the city, which has done service for many of the town pioneers, is being donated to the new pioneers of land at Fairbridge Farm School, Cowichan Station, by Joseph Rose.

It will grace their new chapel being completed about mid December.
The clock is interesting both intrinsically and historically. The face itself is five feet in diameter, and the workings are operated by a complicated system of pulleys from inside the building. It was brought out to Victoria from Croydon, England, where it was made for Charles E. Redfern. It was the first city clock and is a twin of the one on the City Hall. Mr. Rose purchased it 17 years ago, bringing it from Vancouver, where it had strayed.

Like all landmarks it has through the years gathered stories about it. The tale goes that in the old days, the men working in the bank just across the street, would regularly every day when the clock struck three, drop their pens, pull on their coats and step across for a glass of froth in the tavern once situated just below.

For a long time, too, there was much controversy about whether the clock was to strike or not strike. It seems the gong had an extra loud tone, and disturbed the sleep of many residents around. Obligingly Mr. Rose did away with the gong although, bringing down upon his head the complaints of many more citizens, who swore they were now late for every appointment, and never did know the time, because they always set themselves by the chimes. The gong was replaced, and the sleepless faction again rose up in arms and the argument began all over. Finally it was decided that the sleep of the citizens was the more important and the clock has remained mute ever since.

The bell was in the early days also used as a fire alarm. ${ }^{41}$

In the last summer of 1938 Major J.H. Feilden of Blackburn, Lancashire visited the new Prince of Wales Fairbridge Farm School located at Cowichan Station some 45 kilometres north of Victoria. Asking what else the school for underprivileged British children needed a chapel was immediately mentioned by Principal Col. Harry Logan. The next day Major Feilden, who was staying at the Empress Hotel in the capital city, sent a letter to Col. Logan along with a $\$ 20,000$ cheque for the project. Plans were started almost immediately by the farm school's architect and planner Ross A. Lort with final design changes proposed by Sir Herbert Baker shortly thereafter. Work on the large chapel began in the spring of 1939 with the foundation stone ceremony taking place on September $22^{\text {nd }}$. Able to accommodate 400 people it may actually have been the last religious building constructed in Canada with a tower to contain a functioning turret clock.

It is not exactly known when the clock was brought up to the farm school and installed in the Fairbridge Chapel. Early photos taken during the spring cross country race on March $27^{\text {th }}, 1940$ show the front opening of the clock tower boarded up. The dedication of the chapel took place less than a month later on Saturday, April $20^{\text {th }}$ and while there is no mention of the clock and bell being in place or operating in the extensive article carried in the local press, it is likely the clock was put up in the tower around this time. Both Mr. and Mrs. Rose were among the 250 guests attending the dedication ceremony. The Daily Colonist wrote, "The building of a church has touched the people of Vancouver Island, and many visitors have watched its progress and have made gifts to it. The church tower is to have a clock with a bell to strike the hours. They are the gift of Mr. Joseph Rose, of Victoria, B.C., who has been happy to link the Farm School with the city of Victoria. This clock has struck the hours for the past sixty years in the city and has been a place of meeting for settlers from England. Now it will summon the children." ${ }^{42}$

After it was installed the job to keep the clock wound and maintained fell to Mr. J.K. (Morley) Bulcock who was the farm school caretaker. There were a suggestion put forth by one school patron to purchase a peal of bells for the chapel but this matter was delicately approached and school executive suggested it would be more appropriate for Mrs. Gascoigne to fund the acquisition of "a gramophone for the bell tower." ${ }^{43}$ In late 1946 Gillett \& Johnston were contacted to see if they could make two additional dial faces for the clock. Company sales manager, Mr. R.F.A. Housman, replied at the end of November that they "no longer have the patterns of the dials and the surrounding casting as they are obsolete" and suggested a local foundry may be able to manufacture the new dials and hands. ${ }^{44}$ This correspondence was then shown to the farm school Chaplain, T.L. Hipp who wrote, in part, the following memorandum to William J. Garnett who was then the school principal.
"One is glad that the provision of additional dial faces has been considered; it has come up in conversation with the boys what a help it would be to be able to see the clock from the chicken-house and from the lower field. Some of this no doubt could be put down to "watching the clock",
but most of it to honest motives for we are, and must be, so much governed by time here, and the Chapel clock is our standard.

The cost does not seem excessive, and one feels that the outlay would be well justified... ${ }^{45}$

As things turned out the farm school which opened in 1935 and saw a total of 329 children come from the British Isles closed in 1950. Mr. and Mrs. Bulcock remained employed by the Fairbridge Society until the 1970's and the chapel heated during the winter months and the turret clock wound at least twice a week, as it is today. During this time the many farm cottages were rented to new families emigrating from England and Scotland, some eventually established their own farms.

The chapel was only occasionally used after 1950. One area church rented it temporarily for a few years while they were constructing their own church in Duncan. Then, in the early 1970's a group called

The Friend of the Prince of Wales Fairbridge Farm Chapel received permission to try and maintain the building, now about to fall into disrepair, even though it still contained the old clock and bell, the beautiful stained glass memorial windows and the expensive 1927 Harrison \& Harrison pipe organ originally located in Halsway Manor, Somerset, England that had been donated by Mrs. W.N. Mitchell for the chapel in 1938.

The Friends first annual report mentioned that in July and August of 1971 the chapel was opened and cleaned. On August $21^{\text {st }}$ a semi-private Eucharist was held and "the offerings of the People collected at the service was expended in the dismantling, repair and setting up of the Rose Clock in the tower of the church. The Clock Shop, Victoria, attended to this matter and we were appreciative of their kindness inasmuch as the total costs, which were one hundred dollars, when discounted at $15 \%$. When re-mounted in the upper chamber of the tower and re-set it was observed to keep the time very accurately and to strike the hours correctly." ${ }^{46}$ The following year things started to go haywire for the Friends reported in their second annual report that while the clock was wound periodically "there were problems with the clock gaining and losing time-up to ten minutes-as they were continually adjusting the pendulum weight" and also mentioned they were oiling the clock. In the September $10^{\text {th }}$ entry it mentioned the clock was "oiled last night", then in a line below "Serious, oil stops clock, won't keep going, phone Clock Shop" ${ }^{47}$ and then there is mention of them applying naptha gas to wash 3 -in-1 oil off and set it going. After that the Friends (no name shows up in the reports) tried sewing machine oil but the clock continued to stop after a period of time and kept gaining five or ten minutes a day. For the next five years or so the clock was only occasionally wound as it remained out of sync and finally the Friends not knowing what was wrong and with no money abandoned all attempts to keep the clock going.

On January $1^{\text {st }}, 1975$ the Fairbridge Society headquartered in London, England sold parts of the 416 hectare farm school. The 30 hectare village portion which included about 20 buildings such as the cottages, large day school and auditorium, Kenilworth dining hall and chapel were acquired by a Victoria development firm that wished to put in a large residential subdivision. This would have meant many of the original buildings being demolished. As it turned out only three buildings were taken down with all cottages and the chapel saved. With a small residential strata development in place by early 1978, the Cowichan Valley Regional District (CVRD), the local government, took ownership of the chapel.

By now the building was in a very poor state of repair. With nearly 200 windows broken the first action taken was to secure the building, start repairing the windows and do some minor landscaping improvements to make it appear the chapel was still in use. Prior to this the beautiful stained glass windows and organ had been removed to Christ Church Cathedral in Victoria. It would be almost 25 years before the windows and other artefacts made their way back to adorn the Fairbridge Chapel but the organ is a permanent fixture at the church in Victoria.

Throughout this transition period the clock stayed in the chapel and attempts were made, unsuccessfully, to get it working properly. As in the past it would not maintain correct time for more than a few hours. On one occasion the count wheel leaver didn't drop into any slot and the huge weight kept falling at an ever increasing speed until it hit the sawdust on the tower floor. All the time the hammer kept striking the bell. Then, in June, 1978 more problems; someone stole the old bell. We were informed by the police that the chances of having it returned were slim to none. Nevertheless, the Cowichan News printed a short front page story about the theft and a few days later the Royal Canadian Mounted Police (RCMP) received an anonymous tip that the bell could be found in a roadside ditch a few kilometres away "as long as there were no questions asked." ${ }^{48}$ The heavy bell was carefully returned to the clock tower but now includes the RCMP exhibit sticker attached as a reminder of this chapter of its history.

For the next ten years the clock was wound occasionally, usually when there was a wedding. In May 1982 the Fairbridge Chapel and adjacent 1885 one-room Cowichan Public School received heritage designation but the CVRD continued to only allocate a maximum of \$500 per year towards the upkeep of the heritage site and by 1986 funding dropped to zero. Then suddenly a year later no functions were allowed in the chapel and the building condemned and under threat of being demolished. Fortunately the Fairbridge Chapel Heritage Society was founded and thanks to the work by society members and certain members of the CVRD Board of Directors ownership of the property was transferred to the society in the fall of 1988 on condition that various improvements to the land and buildings were made within a decade.

Besides refurbishing the interior of the chapel and improving the landscaping during the first few years so it would be more appealing to hold weddings and concerts the Society decided that the old clock must be properly repaired. Being an historic artefact and now over 110 years old-Mr. Warrick Whitehead, a watch and jewellery specialist from Duncan was hired to restore the Gillett \& Bland clock. The timepiece was removed from the chapel and work was slowly undertaken over the next six months or so. It took a couple of days for Mr. Whitehead to reassemble the clock but when all was said and done it was almost like new and keeping perfect time. That was in 1989 and now, over 23 years later the Society has kept the clock going and it has operated almost without a single problem except when the winter weather becomes extremely cold. Like the problems with neighbours encountered by Mr. Redfern over 100 years ago the Society also had complaints from a family about the bell keeping them awake at night. This situation was resolved satisfactorily when they sold and left the strata about 2001 thus allowing the bell to chime the hour ever since.

The London auction house, Christies, recently advertised an identical copy of the Fairbridge Chapel turret clock for sale which provided more information about this particular timepiece (see picture on the next page). The Gillett \& Bland model is called a "Victorian two-train small turret clock" and has "deadbeat escapement with brass anchor and adjustable steel pallets, escape wheel screwed to the collet, the strike train with brass count wheel and frame case with the manufacturer's signature Gillett \& Bland Croydon AD 1875." 49 The only difference is that the Fairbridge clock's brass coloured setting dial is signed C.E. Redfern while the one for sale at Christie's is signed Gillett \& Bland Steam Clock Factory Croydon. ${ }^{49}$ Additional information about the Fairbridge clock is in the appendix.

On a final historical note, besides the Fairbridge Chapel turret clock being one of the oldest operating public clocks in Canada it is also one of only two within a Vancouver Island religious building. St. Peter's Church, Nanaimo has the other clock and bell. Originally it was located in the old Nanaimo post office (now demolished) and called Big Frank after the local member of parliament of the day, Frank H. Shepherd, who was instrumental in getting the timepiece for the city in 1911. ${ }^{50}$


Chapel Clock The two train G \& B clock movement operating in 2012.

Name Plate \& Setting Dial
Indicating the clock was manufactured in 1875 with the owner's name, C.E. Redfern stamped on the setting dial.


Chapel Bell Some of the name and date (1876) on the top ring, C. E. R, for Charles E. Redfern and Victoria.

The bell is tuned to the note of " $C$ "


This is an identical Gillett \& Bland two train turret clock movement to the one in the Fairbridge Chapel but is dated $\mathbf{1 8 7 6}$. It was for sale by Christies Auction of London in 2012.

## History of the Gillett \& Johnston Clock and Bell Company

```
Town clocks were at one time, a point of pride in
a community, erected at great expense, and
thereafter 'everyman's pocket watch'.
    Donn Hamon Lathrop
    National Association of
                Watch and Clock
                        Collectors, Vermont
```

The Gillett \& Johnston Company is one of the oldest clock manufacturing companies in the England. From 1844 to 1950 over 14,000 tower clocks and many thousands of bells were made at their Croydon factory which is still in business.

William Gillett was the founder of the company having started his clock making in Hadlow, Kent under the patronage of Lord Sackville-West where he only made small clocks. After briefly working in Clerkenwell, London he moved to Union Road, Croydon where he started his own firm in 1844. ${ }^{51}$ This proved to be a very exciting time for the advancement of clock manufacturing in England as previously mentioned. It was at this time that the flatbed turret clocks were being developed although early Gillett \& Bland clocks included an A-frame model. The Marysville Museum in Victoria State, Australia had an 1856 A-frame clock that was probably operating at the museum up to February $7^{\text {th }}, 2009$, the day the museum was destroyed in the bushfire that swept the area and killing a number of residents. ${ }^{52}$

Around 1854 Charles Bland became a partner and was the skilled salesman for the company. Through his efforts he promoted the clock company and soon a number were being manufactured for church turrets, public clocks at railway stations and various businesses throughout the British Isles and then overseas. The company was one of the first steam-powered clock factories in the world and in 1868 the company, now known as Gillett \& Bland built a tall clock tower at the factory in Croydon with four different designs of dials to advertise their business. Arthur Anderson Johnston became a partner in the firm in 1877 and the firm became known as Gillett, Bland \& Co. until Charles Bland's death around 1884 with the company name again changing, this time to Gillett \& Co. Flatbed turret clock models with the Gillett \& Co. frame inscription was only used for about two years at which time the company title once again changed to Gillett \& Johnston. It was when Johnston became a partner that the bell foundry was evidently established although, as can be noted from the Fairbridge bell, they were already either making bells or having them made by another foundry for their clocks. The Fairbridge bell has "Gillett \& Bland Croydon London 1876" on the inscription band. If the Fairbridge bell was made in their new foundry it had to be one of the very first they cast. However, it may also have been made for Gillett \&Bland by the John Taylor Co. since the records of bells produced in their own foundry start in 1877 . Gillett \& Bland supplied a number of clocks to the John Taylor Co. as the latter firm never manufactured their own timepieces. There were other clocks, for example, at the Cambridge Military Hospital tower which had bells with the inscription: "Cast by Gillett Bland \& Co., clock makers to Her Majesty, Croydon 1878 London."53

By the mid-1880's Arthur Johnston was in control of the foundry and it is reported that at this time William Gillett (1823-1886) had emigrated to the United States. Cyril Frederick Johnston joined his father in the business in 1902 and by 1907 was a partner.

In April 2010 the Carillon News published a short story titled 1510-2010 Celebration of the Five Hundredth Anniversary of the Carillon in which they mentioned, "The art of tuning (bells) declined after the death of the Hemonys, and by the $19^{\text {th }}$ century, it was crudely practiced, if at all. The John Taylor \& Company foundry in Loughborough, England, began to redevelop the art of accurate tuning at the end of that century; and they were soon followed by the foundry of Gillett \& Johnston in Croydon, England, makers of the original two octaves of bells in the Emery Memorial Carillon." ${ }^{54}$

At it turned out in 1906 five bells delivered to the Elstree School in England were rejected and returned to Gillett \& Johnston (G\&J). "Not wanting the recasting job to go to competitors, Cyril Johnston acquired a tuning machine, over the objection of his father Arthur A. Johnston." ${ }^{55}$ The turning machine resulted in the bells to be recast the following year and it was from this point on that G\&J's greatness can be tracked. This single event, which allowed bells to be properly turned, thus improving the art of change ringing in churches actually, "contributed to the elevation of the carillon to a concert instrument." ${ }^{56}$

Previous to this Gillett \& Johnston had not only been casting bells for clocks and churches but also buoy bells for the Trinity House. In 1881 they cast two bells weighing over two tons each for the Eddystone Lighthouse. Foundry records indicate that large numbers of bells weighing approximately 3cwt. (150kg) were case for the use in buoys by both Trinity House and other organizations.

It took until 1906 before a competitor caught Taylor's lead and it was Cyril Johnston of Gillett \& Johnston who exploited True Harmonic tuning for buoy bells; he theorized that they had greater carrying power then their predecessors. His company cast experimental bells for Trinity House (TH) to prove this theory. A tale that has passed into bell-founding folklore is shortly after the Great War, Cyril Johnston persuaded the TH authorities to arrange a trial whereby two buoy bells were moored a mile apart, one being a standard buoy bell cast by Warner's and the other an experimental Gillett \& Johnston bell tuned to the True Harmonic principal. Observers on a launch moved away from the bells until only one could be heard
and of course it was the Gillett \& Johnston bell. Presumably, as a result of this trial, TH produced a specification and drawings for the "improved" buoy bell. This included the now familiar flange top for securing the bell also enabling easy rotation when in place on the buoy allowing the hammers to strike on un-worn surfaces. ${ }^{57}$

One of the re-used Gillett \& Johnston buoy bells is now located in the Holy Rosary Cathedral in Vancouver while others have been sent to churches throughout England, Australia, Tanzania, the United States, Nigeria and Thailand.

Cyril Johnston, as mentioned above, is credited as the bellfounder who rediscovered the art of bell tuning, an art form which had been lost for more than 200 years, and made the name of Gillett and Johnston synonymous with bells and carillons throughout the world. There are 11 carillons in Canada including our most famous the Parliament Building Peace Tower Carillon, often referred to as "Cyril Johnston's Westminster Clock Tower in Canada" which has a total of 53 Gillett \& Johnston bells cast in 1926 and 1927. Naturally the original clock in the Peace Tower was also manufactured by the firm. ${ }^{58}$ Of the 11 carillons five were designed by the firm and all still have the original cast bells from the G\&J foundry although over the years some bells have been added from other foundries to a few of the carillons.

Arthur Johnston died in 1916 and during the World War I the factory and its machinery were required to make munitions. With an expansion of the plant they were soon making nearly 40,000 fuses each week employing some 1,150 men and women working around the clock. Once the war was over the factory and foundry had extra space so they were able to design new machinery for bells, turret and small clocks. It is not known exactly how many bells they manufactured since the firm began but it is believed that more than 14,000 turret (tower) clocks installed around the world were manufactured by Gillett \& Johnston from 1844 to 1950 and while Cyril Johnston was with the firm starting in 1902 he was responsible for the casting of over 11,000 bells. In all the company cast bells for 54 carillons, including one travelling carillon, between 1922 and 1954. ${ }^{59}$

The name of the company changed once again in 1925 to The Croydon Bell Foundry Ltd. and in 1930 to Gillett \& Johnston Ltd. It was in the mid 1920's that the clock side of the business was under the management of F.W. Elliott Ltd. but still made at the foundry under the umbrella firm of Gillett \& Johnston. Evidently Cyril Johnston resigned as Managing Director over a matter of policy in 1948, but by now was described as the greatest bellfounder ever. He received the Order of the British Empire in June 1948, but died a little under two years later on March $30^{\text {th }}$, 1950. The bell foundry closed in the early 1950's although the company continued to have bells cast to their original specifications by other foundrys. ${ }^{60}$

In 1957 the company was purchased by the Bath Portland Group and moved to the Wembley area. A year later the bell founding side of the business was sold to Cope Allman International and the clock section to Synchronome. ${ }^{61}$

By 1962 Cecil Hector Coombes who had worked for Gillett \& Johnston Ltd. for a number of years first in the drawing office and then as their overseas marketing and sales manager bought the turret clock side of the business returning it to Croydon. It was first relocated to Sanderstead Road. Cecil Coombes died in 1972 but his wife Doris continued to manage the business until she retired in 1976 at which time son Stephen Coombes became Managing Director. By 1998 Gillett \& Johnston Ltd. again moved to Selsdon Road and the Coombes family continues manufacturing, and repairing clocks and bells throughout Britain and around the world. ${ }^{62}$

As mentioned there are many thousands of clocks manufactured by this remarkable British firm not to mention the thousands of bells their foundry also turned out over the decades. They made small
beautiful mantel clocks, and Grandmother or "Master Clocks" that stood in a hallway or corner of a home, post office clocks (the Type 46 is an excellent example), all the way up to large turret clocks. There is an appendix listing just a few turret clocks, churches bells, carillons and other historic buildings, memorial structures or gardens throughout Canada and elsewhere in the world where there is a functioning clock or bell made by the world renowned Gillett \& Johnston firm of Croydon.

```
The bells that he has made are sounding melodiously
    in America and Canada, and elsewhere, when you and
    I are in bed and asleep. They are ringing here,
        there and everywhere in England while we are at
            work. They will go on ringing through the
    centuries, for there is no limit to the life of a
                        bell.
                            Tribute to Cyril Johnston
        redhillandheigatelife.co.uk }\mp@subsup{}{}{63
```


## THE FAIRBRIDGE TURRET CLOCK

## INTRODUCTION

THE FOLLOWING INFORMATION IS PROVIDED ABOUT THE TURRET CLOCK THAT IS OWNED AND MAINTAINED BY THE FAIRIBRIDGE CHAPEL HERITAGE SOCIETY. SOME OF THE TECHNICAL INFORMATION MENTINED BOTH IN THE PAPER AND THIS APPENDIX MAY CHANGE UPON CLOSER INSPECTION BY OTHER MORE KNOWLEDGABLE CLOCK KEEPERS. THE TURRET CLOCK RECORDING FORM OF THE ANTEQUARIAN HOROLOGICAL SOCIETY, TURRET CLOCK GROUP OF ENGLAND IS BEING FOLLOWED.

## LOCATION

TOWN, VILLAGE AREA NAME:
NAME OF CLOSEST CITY

NAME OF BUILDING
DEDICATION OF CHAPEL ADDRESS

LOCATION OF CLOCK

PREVIOUS LOCATION IF MOVED FROM
ANOTHER BUILDING/PLACE

PHOTOS ATTACHED

GUIDE/LITERATURE

## FAIRBRIDGE

DUNCAN, 3 KILOMETERS NORTH
VANCOUVER ISLAND, BRITISH COLOUMBIA

FAIRBRIDGE CHAPEL
APRIL $20^{\text {TH }}, 1940$
4791 FAIRBRIDGE DRIVE

TOWER
C.E. REDFERN JEWELLERS
a) 43 GOVERNMENT ST. b) 1009 GOVERNMENT ST. JOSEPH ROSE JEWELLERS 1013 GOVERNMENT ST. VICTORIA, B.C.

INCLUDED

OTHER LITERATURE AVAILABLE FROM CLOCK KEEPER, RON SMITH AND SOCIETY

## OTHER COMMENTS

The Fairbridge Chapel Heritage Society maintains a web site www.fairbridgechapel.com with other contact information, news maps, photos and contacts. In addition the Fairbridge Canada Association has their own web site at www.fairbridgecanada.com with additional historical information and news.

TURRET CLOCK DETAILS

MAKER
MAKER'S TOWN
DATE OF CLOCK
SETTING DIAL INSCRIPTON
FRAME INSCRIPTION

FRAME TYPE

GILLETT \& BLAND
CROYDON, ENGLAND
1875
C.E. REDFERN

GILLETTE \& BLAND, 1875 A.D.

CAST IRON FLATBED
$58 \mathrm{~cm} . \times 28.5 \mathrm{~cm} .46 \mathrm{~cm}$

TRAINS \& GOING PERIOD

GOING PERIOD
ESCAPEMENT LENGTH OF PENDULUM OR

OTHER INFORMATION

DIALS
NUMBER OF DIALS
NUMBER OF HANDS
SIZE OF DIALS

OTHER INFORMATION

CONDITION OF CLOCK

MAKER
MAKER'S TOWN
DATE ON BELL
OTHER INFORMATION

BELL DIAMETER

GOING \& STRIKING - 2 TRAINS
NUMBER OF WHEELS IN GOING TRAIN-5 NUMBER OF WHEELS IN STRIKING TRAIN-2

APPROXIMATELY 6 DAYS

DEADBEAT
1.55 METRES

PLUS WEIGHT, .61m. AND TOP ROD .61m. EQUAL 2.75 METRES

WINDING JACK IS USED, EXTRA JACK
AVAILABLE
DIAL SETTING SPANNER

2 CAST IRON
2 ON EACH DIAL
1.1 METRES IN DIAMETER

ONLY ONE DIAL FACE IS OUTSIDE THE TOWER ABOVE THE FRONT ENTRANCE TO THE CHAPEL. OTHER IS INSIDE THE TOWER IS OPERATIONAL AND WITH THE NAME ROSE ON THE WHITE COLOURED SEMITRANSPARENT GLASS.

GOOD/VERY GOOD

## BELL DETAILS

GILLETT \& BLAND
CROYDON, ENGLAND
1876
GILLETT \& BLAND CROYDON \& LONDON 1876 ON THE BELL INSCRIPTION RING.
THE BELL MAY HAVE BEEN REPAIRED CRACK WHICH LOOKS TO BE VERY ANCIENT PAINTED ON THE SIDE OF THE BELL ARE THE LETTERS "CRF, VANCOUVER'S ISLAND" and NOTE 'C' "
40.64 CENTIMETRES

## RECORDER INFORMATON

## NAME

ADDRESS OF RECORDER

PHONE
DATE OF SURVEY
AND

RON SMITH
4718 FAIRBRIDGE DRIVE
DUNCAN, B.C. CANADA V9L 6N8
2507467519
THURSDAY, JUNE 16, 2005
FRIDAY, JANUARY 6, 2012

## OTHER INFORMATION

## APPENDIX B

## SOME TURRET CLOCK TERMS

Most of this information is from The Turret Clock Keeper's Handbook by Chris McKay and published by the Antiquarian Horological Society, 1998.

A Turret Clock is a clock which is intended to make the time known publicly either by striking on a bell or bells, showing the time on an external exposed dial, or both. A number of North American publications often refer to the timepieces as being a Tower Clock.

A Clock Tower is a tower built with a large clock face on one or more of its sides so as to be visible to a large number of inhabitants of an area. The mechanism inside the tower is known as a turret clock.

| Arbor | Horological term for axle. |
| :--- | :--- |
| Barrel | Wood or metal cylinder around which the weight line is wound. |
| Belfry | Chamber where bells are hung. |
| Bell Hammer | Hammer to sound bell. |
| Bob | Weight on the end of the pendulum. |
| Bushings | Brass bearings n which pivots run. |
| Cast Iron | Iron cast in a mould. |
| Centre wheel | Wheel in going train turning once an hour. |
| Count wheel | Wheel to set the number of blows striking when the clock strikes. |
| Dead beat | Type of escapement. |
| Dog Clutch | Device to set hands to time. |
| Escape wheel | Wheel on which the pallets act. |
| Escapement | Device to release one tooth at a time and to impulse pendulum. |
| Flatbed | Type of turret clock frame. |
| Fly | Fan-shaped device to limit the speed of striking. |
| Foliot | Timekeeping device consisting of a weighted bar. |
| Frame | Iron, wood or brass structure to contain movement's wheels. |
| Friction clutch | Device to set hands to time. |
| Going train | Train of gears which drive the dial. |
| Great wheel | The largest wheel in a clock train. |
| Leading off rod | Rod connecting the clock to a dial. |
| Leading off work | Collection of rods and gears to connect the clock to a dial. |
| Line | Line suspending the driving weight, usually of galvanised steel. |
| Maintaining power | Device to keep clock running whilst it is being wound. |
| Motion work | Reduction gears behind a dial to drive the hour hand from the minute hand. |
| Movement | Clock mechanism. |
| Pallets | Parts of an escapement which engage the escape wheel teeth. |
| Pendulum | Device swinging at a constant rate. |
| Pinion | Small gear of 12 teeth or less. |
| Pivot | Part about which a wheel turns. |
| Pulley | Used to guide weight lines. |


| Rack | Device to count number of blows to be sounded at the hour. |
| :--- | :--- |
| Ratchet | Gear wheel with saw-like teeth arrested by a click |
| Rating Nut | Nut to adjust the timekeeping of a pendulum. |
| Setting Dial | Internal dial to enable external dial to be set to time. |
| Striking | The sounding of a bell at the hour. |
| Suspension spring | thin spring from which the pendulum hands |
| Train | Collection of gear wheels. |
| Verge | Type of escapement. |
| Warning | The release of the striking or a chiming train a few minutes before striking or |
|  | chiming. |
| Winding crank | Handle to wind clock. |
| Winding jack | Reduction gear to make winding a clock easier. |
| Winding square | Square on barrel onto which the winding crank is fitted. |

## SOME BELL TERMS

\(\left.$$
\begin{array}{ll}\text { Bell } & \begin{array}{l}\text { A cup shaped, cast bronze percussion instrument, sounded by a clapper or } \\
\text { hammer. }\end{array}
$$ <br>
One that calls members of a congregation to worship, and usually swings for <br>

that purpose. Sometime it can also be tolled for funerals.\end{array}\right]\)| One that is hung dead to be struck under control of a tower clock to indicate |
| :--- |
| the hours of the day. Some tower clocks also strike once at the half hour. |
| Clock bell |
| Fire bell or Alarm bell |
| Usually hung dead, and was struck in distinctive patterns to warn the |
| community of fire or other danger. |

There are other kinds of bells which were never intended for use as a turret or tower bell but have been used that way from time to time. Examples are railroad bells (bronze), an example is in St. Andrews Church, Cowichan Station, and farm or dinner bells (cast steel). The Prince of Wales Fairbridge Farm School had a large railway engine bell used as a dinner bell.

## CARILLON \& BELL RINGING TERMS

Bell chamber The space containing the carillon and its frame. Also called the "belfry," although the name has to do with the Latin word for a lookout tower. The bell chamber may be enclosed or completely open but it must have some openings to allow for the egress of the sound.

## Campaniles

Carillon
A freestanding tower containing a carillon. The Peace Tower in Ottawa and the Netherlands Centennial Carillon in Victoria are two Canadian examples.

A musical instrument composed of at least two chromatic octaves of tuned bells, played from a keyboard that permits expression by variation of touch.

| Change of Ringing | The traditional way of ringing five to 12 bells in England. The bells in a ring are hung to swing through slightly more than 360 degrees. |
| :---: | :---: |
| Chime | A musical bell instrument composed of less than two chromatic octaves, but with at least one diatonic octave of bells. That is a range of eight to 22 bells. |
| Clapper | The part of the carillon action that strikes the bell, causing it to sound. |
| Dynamics | Varying degrees of loudness or softness in a musical performance. |
| Hammer | Similar to a clapper, except that they are mounted to the bell frame outside the bell and strike the outside of the bell. Hammers are usually used when a chime or carillon bell is hung for swinging, since the clapper can't be connected to the action. Hammers are also used for clock strikes. |
| Keyboard | Also called a clavier or console. The part of a carillon by which the performer plays the instrument. |
| Lathe | A machine tool used to turn bells. The bell is turned upside down and placed on a rotating base. As it turns, a precisely placed tool cuts metal out of the inside of the bell. |
| Peal | Usually used to designate three or more bells hung to be swung together. Bells of different weights have different natural swing rates. Sometimes, several bells in the lower octave of a carillon are arranged to swing as a peal. |
| Profile | the shape of a bell, the primary determinant of the bell's tone. It is created by the shape of the casting mold and is adjusted in the tuning process. |
| Ring | Five to 12 bells hung for change ringing. |
| Tuning | The process of adjusting the profile of a bell so that the first five partials of the bell bear a harmonic relationship with each other, while at the same time, the bell is tuned to the other bells in the carillon. Once tuned at the foundry, a bell needs no further tuning during its life, unless damaged by corrosion. |

## APPENDIX C

## SOME CLOCKS \& BELLS <br> MANUFACTURED BY GILLETT E JOHNSTON

## 1. TURRET OR TOWER CLOCKS

The following are some of the turret (tower) clocks that were manufactured by Gillett \& Bland/Gillett \& Johnston that are located in various buildings and other public towers within Canada as well as elsewhere in the world.

## a) Canadian Locations

| Name \& Location | Building Type | Date of Clock/Bell |
| :--- | :--- | :---: |
| Prince of Wales Fairbridge Farm School <br> Fairbridge, Cowichan Station, B.C. | Chapel | 1975/1876 |
| City of Fredericton <br> Fredericton, N.B. | City Hall | 1878 |
| Victoria City Hall <br> Victoria | City Hall | 1891 |



## 2. CARILLONS

There are over 600 carillons around the world with almost 300 in three countries, Netherlands, Belgium and Denmark. The United States has 164 listed while in Canada there are 11. Five carillons were installed by Gillett \& Johnston, all in Ontario, and listed below.

| Name \& Location | Number of Bells | Year Installed |
| :---: | :---: | :---: |
| Metropolitan United Church | 23 (54)* | 1922 |
| Massy Drury Memorial |  |  |
| Toronto |  |  |
| Norfolk County War Memorial | 23 | 1925 |
| Simcoe |  |  |
| St. George's Anglican Church | 23 (36) | 1926 |
| Cutten Memorial |  |  |
| Guelph |  |  |
| House of Commons | 53 | 1927 |
| Peace Tower |  |  |
| Ottawa |  |  |
| Hart House, Soldiers' Tower, | 23 (51) | 1927 |
| University of Toronto, Toronto |  |  |
| * indicates additional bells add | to the carillon at a | essarily made by |
| Note: A complete list of all Gille Child by Jill Johnston | \& Johnston carillons | in Appendix 2 of |

## 3. OTHERS

The following are bells or clocks in other features rather than clock towers such as on a roof, side of a building, garden etc.

| Name \& Location | Type | Year Installed |
| :--- | :--- | :--- |
| $\begin{array}{lll}\text { The International Peace Garden } \\ \text { North Dakota/Manitoba boarder }\end{array}$ | $\begin{array}{l}\text { Floral Clock } \\ \text { Garden } \\ \text { Chapel (14 bells) } \\ \text { Peace tower }\end{array}$ | 1932 |
| $\begin{array}{lll}\text { Berlin Freedom Bell } \\ \text { Rathaus Schöneberg }\end{array}$ | $\begin{array}{l}\text { Municipal building } \\ \text { Hampton Court Palace } \\ \text { East Molesey, Surrey }\end{array}$ | Gateway |$] 1976$



## FOOTNOTES

1. Smithsonian, December 1999, page 55
2. Ibid
3. Ibid
4. The Book of What?, page 35
5. The History of Clocks and Watches, 1972, page 71
6. Ibid
7. Advanced countries divided time into 12 hours of light and 12 hours of darkness-from sunrise to sunset and from sunset to sunrise. These are called temporal hours, or unequal hours because the length of the periods of night and day varied throughout the year. The further away from the equator the difference in the temporal hours became greater.
8. Clocks \& Watches-1400-1900, pages 18-19
9. Ibid
10. The Turret Clock Keeper's Handbook, page 7
11. Smithsonian, page 56
12. This England, Summer 2010, page 61
13. Clock, www.en.wikipedia.org/wiki/Clocks
14. Smithsonian, page 56, Clocks \& Watches, 1400-1900, page 105
15. Geni, www.geni.com/people/William-Clement
16. The History of Clocks and Watches, page 63
17. Ibid, page 112.
18. Ibid page 115
19. Building the Great Clock—UK Parliament, www.parliament.uk, page 1
20. Big Ben: The Great Clock and the Bells at the Palace of Westminster, page 85 Note: This clock never went to Fredericton.
21. Building the Great Clock-UK parliament, page 1
22. Turret Clock History, homepages.tesco.net/~ChrisMcKay/tchistory, page 5
23. 1687-Saint-Sulpice Seminary, Montreal, Quebec, www.archiseek.com
24. Canadian Encyclopedia, page 852.
25. Country Post—Rural Postal Service in Canada, 1880-1945, page 65
26. Parks Canada-Halifax Historic Site of Canada
27. www.cobourghhistory.ca
28. www.heritagetrust.on.ca
29. www.emcperth.ca and www.town.perth.on.ca
30. www.HistoricPlaces.ca
31. Ibid
32. www.fredericton.ca, CBC News, June 10, 2010 mentioned that the teeth of a gear broke on one wheel and needed to be replaced.
33. www.caphc.ca
34. www.HistoricPlaces.ca
35. British Colonist, November 28, 1875, page 2
36. Ibid, September 19, 1862, page 3
37. Ibid, June 27, 1876, page 3
38. Ibid, June 30, 1876, page 3 and July 28, 1876, page 2
39. The Colonist, May 6, 1891, page 8 Note: Charles E. Redfern received $\$ 200$ per annum to maintain the City Hall clock
40. British Columbia City Directories 1860-1940, various years
41. Victoria Times, December 2, 1939 Note: Rose’s Jewellery remained in business until 1986.
42. Daily Colonist, April 21, 1940
43. Correspondence from Mr. Green (FFS Secretary) to Mr. Garnett (School Principal), August $27^{\text {th }}, 1946$
44. Correspondence from Mr. R.F.A. Housman of Gillett \& Johnston to Mr. L.A. Grogan, C.A., November $28^{\text {th }}, 1946$
45. Memorandum from Chaplain Thomas L. Hipp to William J. Garnett, December 17, 1946
46. Friends of the Prince of Wales Fairbridge Farm School Annual Report, 1972
47. Ibid, Notes from the Friends of 1972
48. Cowichan News, June 21, 1978 Note: Date on the exhibit sticker is June 6, 1978
49. www.christies.com
50. Hub City, Nanaimo, 1886-1920, page 201 and Harbour City, Nanaimo in Transition, 1920-1967, page 178
51. Town of Croydon reference, www.croydon.gov.uk
52. www.gomarysville.com
53. History of Gillett \& Johnston Note: There is one other bell listed as being cast in 1876 in the records listed in the Church bells of Kent which detail all the G\&J bells that are exist or have existed in that area of Britain. The reference reads "Beckenham (New Beckenham) St. Paul, single bell 1876. A bell of about 4cwt was supplied with a clock. The work was finished in Feb. 1877. Can't find this bell in the G\&J records. It was ordered by Henry Wood and donated by Mrs. Eliza Chalk in memory of her husband." Also England's Child: The Carillon and the Casting of Big Bells by Jill Johnston, page 135
54. Carillon News, April 2010, \#83, page 11 Note: Frances and Peter Hemony of Amsterdam discovered how to accurately turn bells in sets over three octaves, much improving the quality of the instrument. The Emery Memorial Carillon is located in Mariemont, a suburb of Cincinnati, Ohio.
55. Ibid, April 2008, \#79, page 17
56. Ibid
57. The Keltek Trust: ex-Trinity House Buoy Bells, www.btinternect.com Note: Trinity House is the company that maintains all the buoy bells, light houses and light house ships around the British Isles for the government. The full name of the company is "The Master Wardens, and Assistants of the Guild Fraternity or Brotherhood of the most glorious and undivided Trinity and of St. Clement, in the Parish of Deptford Strond, in the County of Kent."
58. The Ringing World, No.6063, Review by George W. Pipe of England's Child: The Carillon and the Casting of Big Bells by Jill Johnston
59. Ibid, and England's Child, page 254 and pages 273-277
60. England's Child, page 242-46, and Bellmakers Heard Worldwide, www.redhillandreigatelife.co.uk
61. Barrie's Virtual Clock Museum, www.clock-museum.co.uk
62. History of Gillett \& Johnston
63. Bell-makers heard world-wide, Life Reporter, www.readhillandheigatelife.co.uk

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Peterson, Jan, Harbour City, Nanaimo in Transition 1920-1967, Heritage House, Surrey, B.C., 2006, ISBN 10-894974-20-4

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## INTERNET SITES

| 1. Fairbridge Chapel Heritage Society | www.fairbridgechapel.com |
| :--- | :--- |
| 2. Fairbridge Canada Association | www.fairbridgecanada.com |

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    Like a city set on a hill, a clock on a tower, be it
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    church steeple or castle wall, can not well be hid.
    Many of the notable and historic towers of the world
    have clocks which toll the hours by day and by night, a
solemn warning to the old and young that time is
passing, and with it golden opportunities which can
never be recalled.
Clock Towers of Waterbury
Waterbury Republican,
Sunday Morning, September 9, 1900

