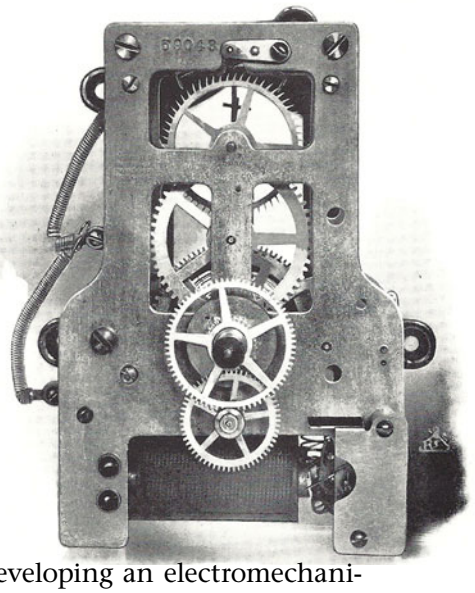
The Self Winding Clock Company and the Ubiquitous Style "F" Vibrator Movement

Tracing its development from the rotary movement



by J. Alan Bloore (CA)

The Self Winding Clock Company (SWCC) of New York began business in 1886 marketing their own electromechanical clocks based on the 1884 clock mechanism patent of one of the company founders, Chester Pond. The innovative principle of this clock mechanism was the incorporation of a small electric winding motor that rewound the mainspring each hour. The clocks were powered by batteries that lasted at least one year. By being automatically rewound each hour, the strain on the mechanism was kept to a minimum, resulting in a very accurate timepiece. At about the same time SWCC began selling clocks, Pond was developing an electromechanical synchronizer attached to the clock movement that could synchronize the clock hands. By 1887 the synchronizers had been so improved that the Self Winding Clock Company could not only market individual clocks but also sell entire synchronized clock systems. The clocks and synchronized systems were sold to railroads, municipalities, banks, insurance companies, schools, universities, and many other entities.

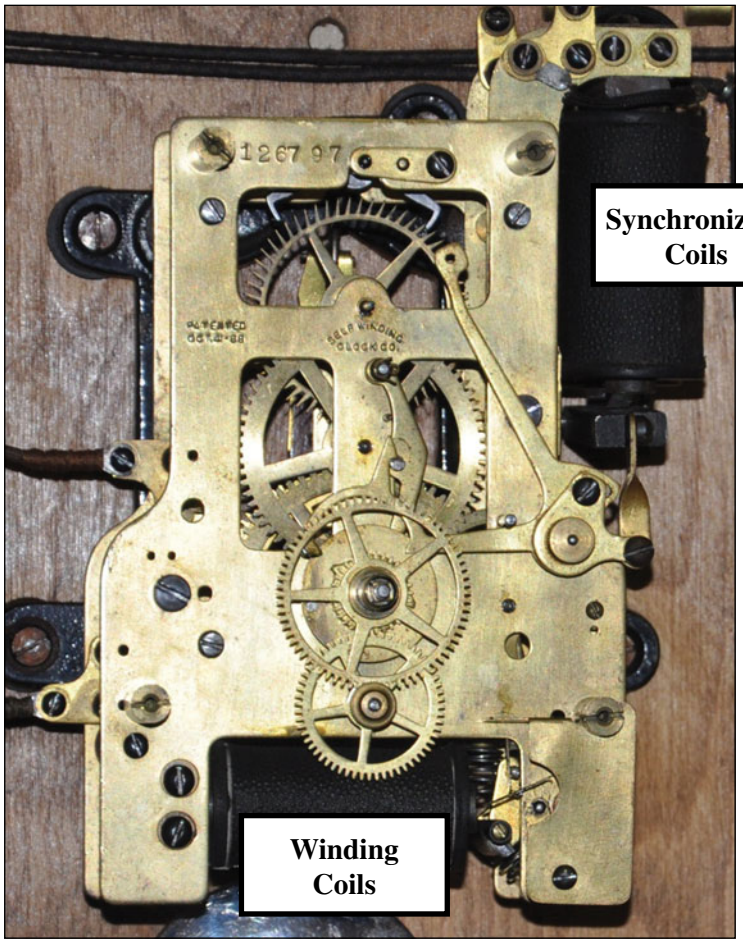


Figure 1. A style "F" Self Winding Clock Co. movement with synchronizer.

Western Union became the largest customer of the Self Winding Clock Company. Two factors were responsible for the long relationship between SWCC and Western Union. The first was the reliability of the SWCC movements. The original movements were wound with a rotary motor, but by 1898 most of the clocks were equipped with the ubiquitous style "F" vibrating motor movement. The second factor was the perfection of the clock synchronizing system. With this combination Western Union could provide its customers with absolutely accurate, reliable timepieces that could be synchronized hourly over Western Union's vast system of telegraph lines.

Clocks with dials that are imprinted SELF WINDING CLOCK CO NEW YORK or NAVAL OBSERVATORY TIME WESTERN UNION were all manufactured by the Self Winding Clock Company. These clocks usually are equipped with a style "F" Self Winding Clock Company electromechanical movement.* The style "F" movement has a pair of coils at the bottom that, when energized, provide power to wind the mainspring one revolution each hour (Figure 1). Most Self Winding Clock Co. (SWCC) style "F" movements also have a second set of coils attached to the movement on the right side. These coils activate a mechanical correction mechanism to precisely set the hands at the hour. This correction electrical impulse would be sent to the clock from a remote location. Many of these clocks were part of the Western Union Time Service and the correction signal was transmitted over Western Union telegraph lines. The correction coils are not involved in the operation of the time train but are solely part of the synchronizing system.

*The oldest Self Winding Clock Company clocks were originally equipped with the rotary-type movement.

The style "F" deadbeat movement is found in 60-beat, 80-beat, and 120-beat versions. The only difference in these movements is in the verge and the escape wheel. There is even a 140-beat version that is exactly like the 120-beat movement except that the third wheel has 70 teeth rather than 60 teeth and the pinion on the escape wheel has the usual eight leaves, but the leaf size and pitch circle diameter are smaller (Figures 2-5). The pendulums, of course, will be different lengths, depending on the beat of the movements.

Each of the clocks at right and below is equipped with the style "F" SWCC movement. The movements were made for years, by the thousands, and are remarkably reliable, accurate, and most importantly, do not require manual winding. The winding is accomplished once each hour by the unique motor incorporated in the clock mechanism. Most of these clocks can be operated with two series-connected "D" cell batteries, providing three volts of power, for a period of approximately one year.**

The horological literature contains no references to the development of this workhorse movement. Unfortunately, the SWCC records apparently have not survived, so a look into company history by studying old company documents is not possible. Fortunately, the style "F" movement (from now on referred to as the "F" movement) front plates were stamped with patent dates, the SWCC name, and serial numbers. This information was valuable in tracing the development of the movement and even revealed who invented the "F" movement.

To understand the development of the "F" self-winding movement, we must go back to the beginning of the clock company. When the SWCC began business in 1886 all of their electrically wound clock movements were powered by a rotary motor. This motor was the unique aspect of patent number 308,521 for an electromechanical clock granted to Chester Pond on November 25, 1884 (Figure 6). The patent model is illustrated with a two-pole motor, but the earliest production models all have a three-pole rotary motor (Figure 7).

Figure 2. SWCC master clock with 60-beat style "F" movement.

Figure 3. Western Union rental clock with 80-beat style "F" movement.

Figure 4. Western Electric SWCC clock with 120-beat style "F" movement (24 volts DC).

Figure 5. Western Union rental clock with 140-beat style "F" movement.

**Self-Winding Clock Company clocks made for Western Electric Company for timing long-distance telephone calls were equipped with coils that required 24 volts DC to wind.

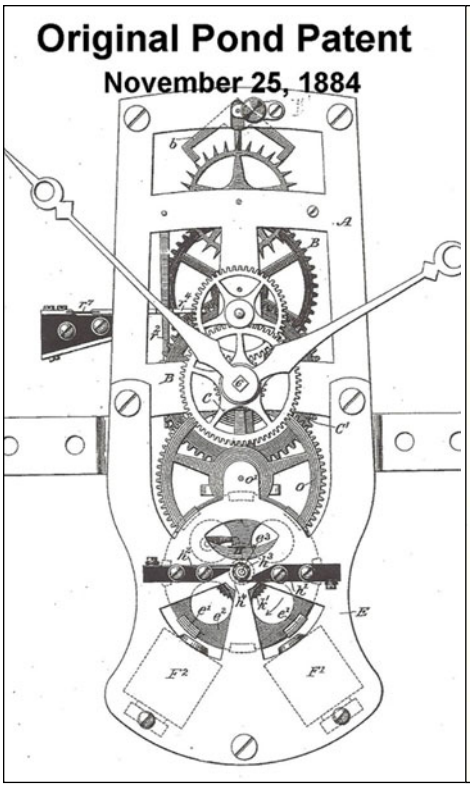


Figure 6. Patent drawing of Chester Pond's electromechanical clock, 1884.

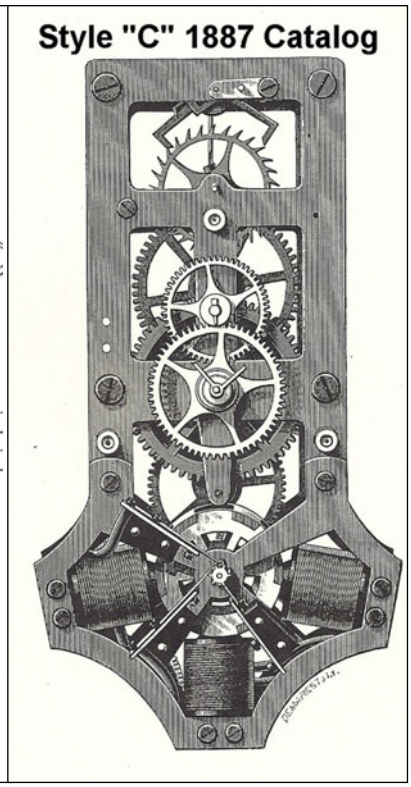


Figure 7. Catalog illustration of style "C" Rotary SWCC movement, 1887.

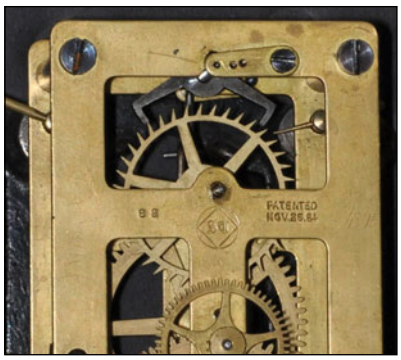


Figure 8. Earliest of SWCC style "C" movements. Serial number to left of escape wheel arbor, Seth Thomas logo under arbor, and patent date to left of arbor.

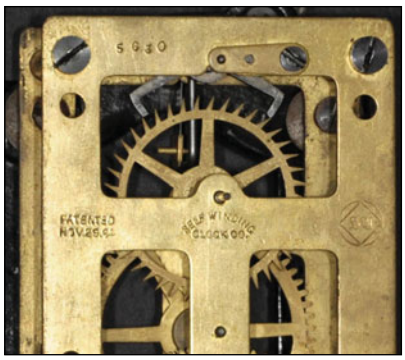
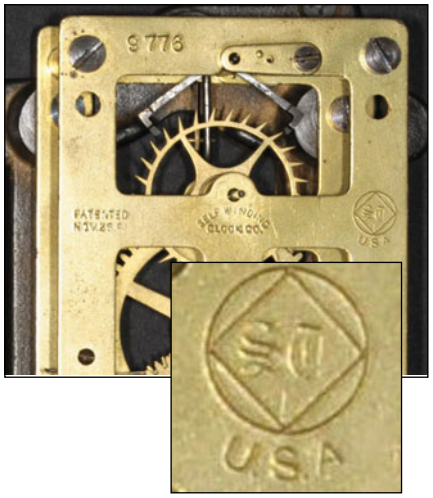


Figure 9. Second version of SWCC style "C" movement. Serial number at top left, patent date to left of escape wheel arbor, Self Winding Clock Co. under arbor, and Seth Thomas logo to right of arbor.



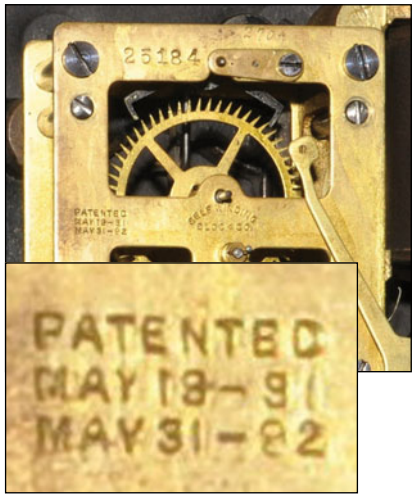


Figure 10, far left. Third version of SWCC style "C" movement. Serial number at top left, patent date to left of escape wheel arbor, Self Winding Clock Co. under arbor, and Seth Thomas USA logo to right of arbor.

Figure 11, left. Fourth version of style "C" movement. Serial number at top left, new patent dates of MAY 18-91 and MAY 31-92 to left of escape wheel arbor, and Self Winding Clock Co. under arbor.

Rotary Movement Serial Numbers and Modifications

The motor winds the clock's mainspring a constant amount one time each hour. The earliest production self-winding rotary movements have "PATENTED NOV. 25, 84" stamped on the front plate to the right of the escape wheel arbor. A serial number is stamped to the left of the escape wheel arbor and a Seth Thomas logo is below the escape wheel arbor (Figure 8).

Throughout the production of the open-plate rotary movement, a patent date was stamped on the front plate. As production continued, the patent date was moved from the right to the left of the escape wheel arbor and now the company name, SELF WINDING CLOCK CO., was stamped under the escape wheel arbor. The serial numbers appear to increase sequentially higher (Figure 9).

The plates always had the Seth Thomas logo; however, as the serial numbers increased, a second version of the Seth Thomas logo that included the letters USA under the diamond appeared and the size of the numerals was larger (Figure 10). These changes in the stamping of the front plates appear to have been done concurrent to, but not directly timed with, various improvements to the rotary movement. I have seen serial numbers with USA under the Seth Thomas logo from serial numbers 9000s to 18,000s.

It appears that by 1892 the Self Winding Company must have been making their own movements, for on the last version of the rotary plates the Seth Thomas logo has been eliminated. A serial number was stamped at the top (again a higher number) and two new patent dates, MAY 13-91 and MAY 31-92 on the left (Figure 11).

The First Vibrator Movement

On this movement, termed the "Type C Vibrator," a completely new method of winding the mainspring was used. The term is derived from Type "C" rotary movement, referring to the open plates (as opposed to the later solid Type A plates)[1,2] and "Vibrator" referring to a winding motor made up of a single pair of coils that used a vibrating ratchet method of winding the mainspring. The time train portion of the "style C Vibrator" movement is the same as the style "C" rotary movement (Figures 12 and 13) except the intermediate wheel is changed to a newly designed winding ratchet wheel from the conventional tooth and pinion wheel. The backplate of movements that were originally equipped with the "C" vibrator have a small cutout at the bottom that appears to be for easier access to the winding lever. Movements that were originally equipped with the "C" vibrator seem to have serial numbers from 25,000 to the 27,000s.

Figure 12. SWCC style "C" rotary movement.

Figure 13. SWCC style "C" vibrator movement.

The style "C" vibrator and the rotary motors are both attached to the time train plates of the Pond-designed movement with four machine screws (Figure 14). Because the style "C" vibrator motor is a self-contained motor, it was also used as a replacement for faulty rotary motors, as functioning movements have been observed without the backplate modification, and on movements with lower serial numbers indicating the movement was originally powered by a rotary motor. The rotary motors were for the most part reliable, but they required periodic maintenance, such as cleaning and adjusting and/or replacing the brushes. This service required a very skilled technician.

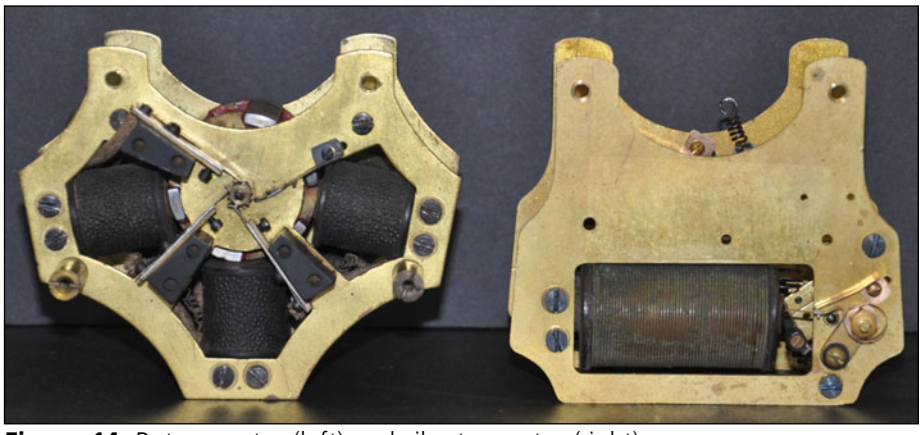


Figure 14. Rotary motor (left) and vibrator motor (right).

The Search for a More Reliable Winding Motor

At the same time the style "C" vibrator was being developed, SWCC was experimenting with other designs of winding motors that would also simply bolt up to the movement plates. A drawing of a redesigned rotary motor was illustrated in an 1893 story about the SWCC's display at Chicago World's Fair (Figure 15).[3] It was surprising that the motor was a two-pole motor similar to, but definitely not the same as, the motor depicted in Pond's original patent illustrations (Figure 6). This new motor included a mechanical pull cord to spin the rotor in the event the motor failed to start the hourly rewind of the mainspring. This seems to belie an inherent design problem in the two-pole motor. It must have been a limited production. As of yet, it has not been possible to fit movement serial numbers to this winding motor.

Concurrent to the search for a more reliable winding motor SWCC appears to have redesigned the open-plate style "C" rotary movement with solid plates and termed the movement the style "A" rotary movement (Figure 16). These movements were still installed in some clocks after the introduction of the "F" movement. Goodrich in 1905 states that SWCC was now almost exclusively putting out vibrator-type movements.[4] Preliminary serial number in-

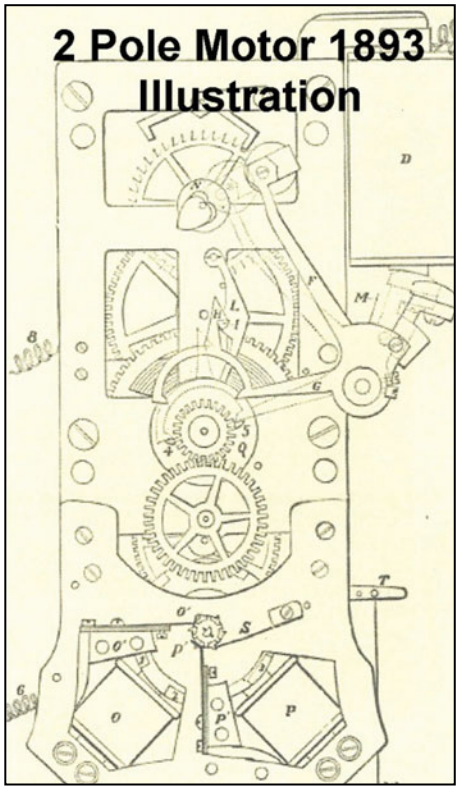


Figure 15. 1893 illustration of redesigned two-pole motor.

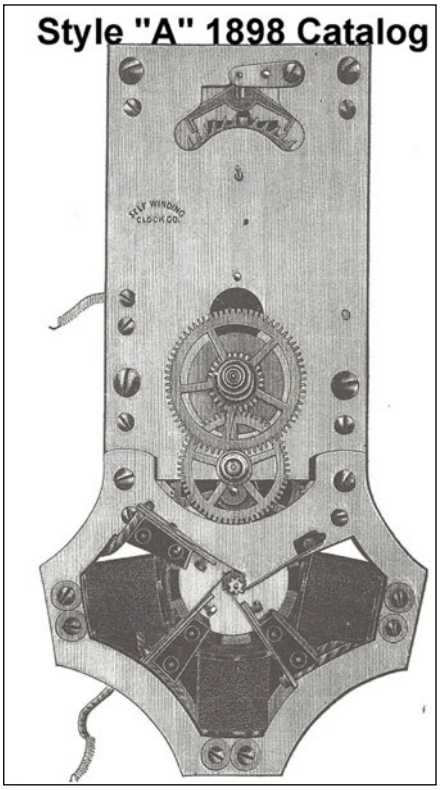


Figure 16. Style "A" (solid plates) 1898 catalog illustration.

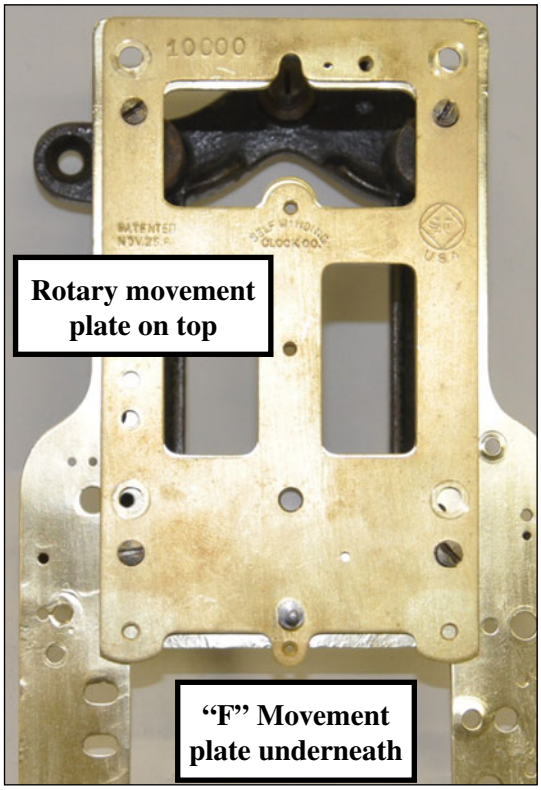


Figure 17. All but the earliest rotary plates and style "F" plates use same mounting bracket.

vestigations reveal these style "A" movements must been numbered from about 29,000 through the 32,000s.

When analyzing the development of the "F" movement, patent dates and serial numbers are most informative. This information is stamped on the front plates of the final type of rotary movements and the earliest "F" movements. Patent dates not only reveal when the invention patent was issued but the patent documents also define the unique features of the invention and identify the inventor. Serial numbers contribute to understanding the progressive movement modifications and how these improvements were eventually incorporated into the "F" movement. Serial numbers for both rotary and "F" movements appear to be sequential and roughly in ascending order.

The "F" clock movement design evolved from the original, Pond-designed self-winding movement, powered by a rotary motor. The "F" movement was designed to use the same mounting bracket as all but the earliest rotary movements. The pivot holes in the "F" movement plates are positioned exactly the same as the rotary plates as can be seen when the "F" plate is placed on the rotary mounting bracket directly under the rotary movement plate (Figure 17). Although the arbors have the wheels and pinions reversed, the time train portion of the "F" clock mechanism is essentially the same as the rotary movement and the uniquely placed mainspring remains on the center arbor. The "F" plates are bigger because this was necessary to accommodate the new vibrator-type winding motor.

"F" Patent Dates Reveal Design Improvements and the Inventor

The patent dates on the front plates of early "F" movements can be used to chronicle the development of the much improved vibrator-type winding mechanism of the "F" movement.

The first patent date stamped on the front plate is MAY 19-91. This refers to patent number 452,392, which was issued to Frederick M. Schmidt of Brooklyn, NY. The title of the patent is "Self Winding Clock." The second patent date is MAY 31-92. This refers to patent number 475,809, which was also issued to Frederick M. Schmidt of Brooklyn, NY. The title of the patent is "Electric Self Winding Clock" (Figure 18). The first two of these patent dates are also stamped on the "Type C Vibrator" movement. The third patent date is OCT. 4-98. This refers to patent number 611,822. The patent was titled "Electric Time Switch" and was granted to Frederick M. Schmidt, James H. Gerry, and William S. Barstow.

Figure 16. Style "A" (solid plates) 1898 catalog illustration.

There are three significant modifications to a winding motor that led to the development of the very reliable "F" vibrator winding motor. The first was the incorporation of a ratchet wheel to be

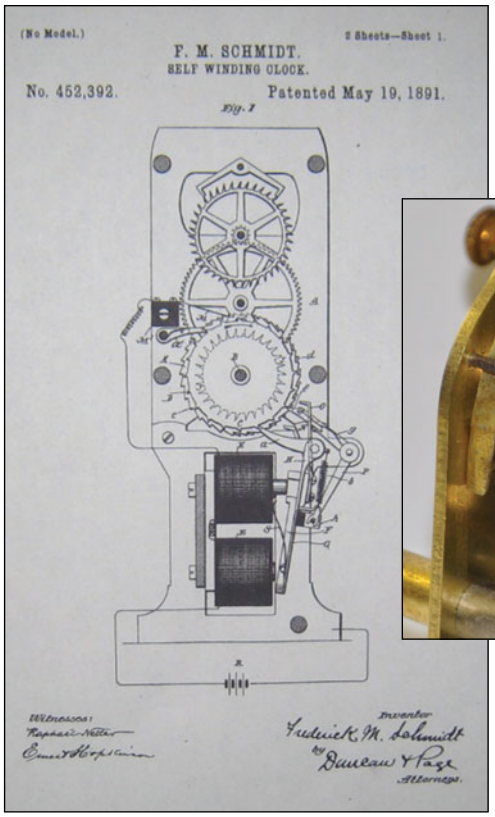
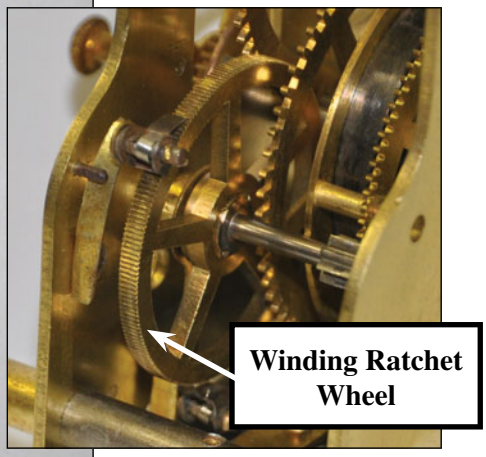


Figure 19, left. Self Winding Clock patent illustration, 1891. Winding ratchet wheel.

Figure 20, below. Style "F" winding ratchet wheel.



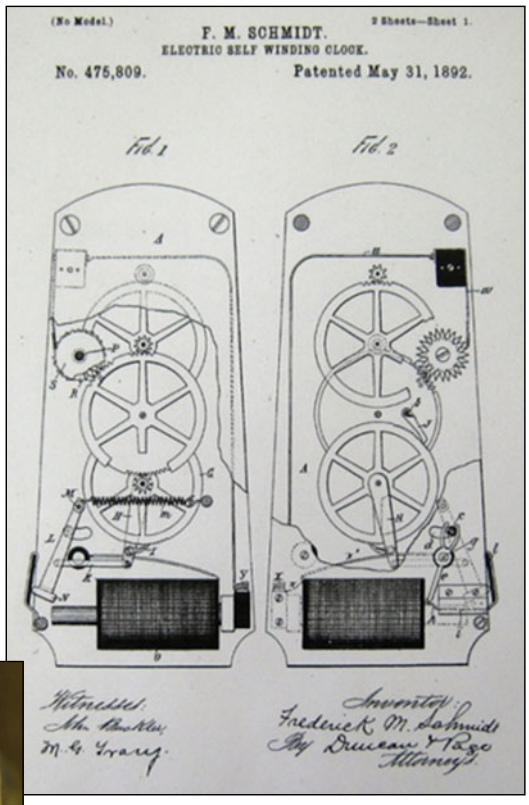
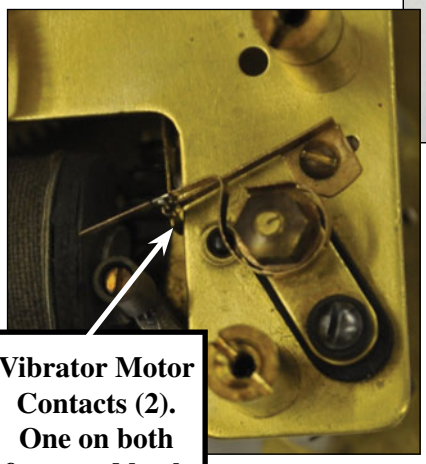


Figure 21, above. Electric Self Winding Clock patent illustration 1892. Additional set of on/off contacts.

Figure 22, left. Style "F" movement with additional on/off contacts.



used to wind the mainspring rather than a direct drive from the motor to the mainspring. This component is covered under the MAY 19-91 patent (Figure 19). In the "F" movement the ratchet wheel is turned by the up-and-down movement of the armature and winds the mainspring (Figure 20).

The second was adding an additional set of on/off contacts to control the winding motor after the center contact energized the winding coil. This component is covered under the MAY 31-92 patent. This was also the first use of just a single pair of coils to wind the mainspring (Figure 21). In the "F" movement the rapid up-and-down movement of the armature is controlled by a pair of on and off spiral motor contacts. There are contacts on each side. These contacts are energized after the hourly circuit closure has closed (Figure 22).

The third was a more reliable hourly circuit closer that did not rely on continuity between the rotor of the rotary motor and the movement plates. This component is covered under patent number 611,822, which was issued OCT. 4-98 (Figure 23). This involved a completely new center hourly winding contact with direct metal-to-metal contact (Figure 24).

It is interesting that Frederick M. Schmidt was granted patent number 502,935 on August 8, 1893, for "Self Winding Electric Clock." This was for Type C vibrator movement, but there was no reason to include that patent number on the "F" movement plates for the design changes had been protected with earlier patents. This patent was assigned to the Self Winding Clock Company of New York (Figure 25).

Frederick M. Schmidt was born in 1868 in New York. I have not been able to find anything about his youth or education, but by the age of 22 he must have been an accomplished electromechanical wizard. His first patent was granted in 1890 and the last in 1916. He has 11 patents related to self-winding clocks. His first three patents were not assigned to the SWCC, but from 1893 on all patents were assigned to SWCC. It is possible that by 1893 he was an employee of SWCC. He eventually became superintendent of the company and remained so throughout the 1920s. I have not seen any reference to Frederick M. Schmidt being responsible for the development of the "F" movement, but it now appears that he was the brains behind the very reliable "F" movement. He obviously was active in all aspects of the time service business, for his patents not only relate to the vibrator winding mechanism but also to electric tower clock movements, electric chimes, electric switches, program clocks, and in 1909 he patented the beautifully designed SWCC slave clock movement.

Figure 23, right. Electric Time Switch patent illustration, 1898. Improved hourly circuit closer.

Figure 24, below. Style "F" center hourly circuit closer.

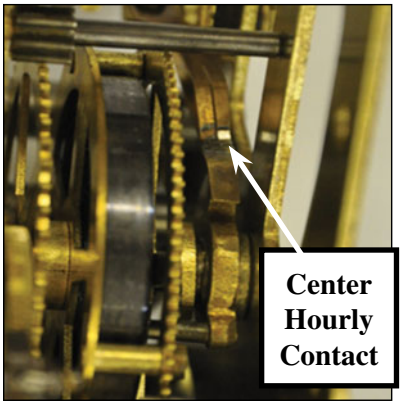
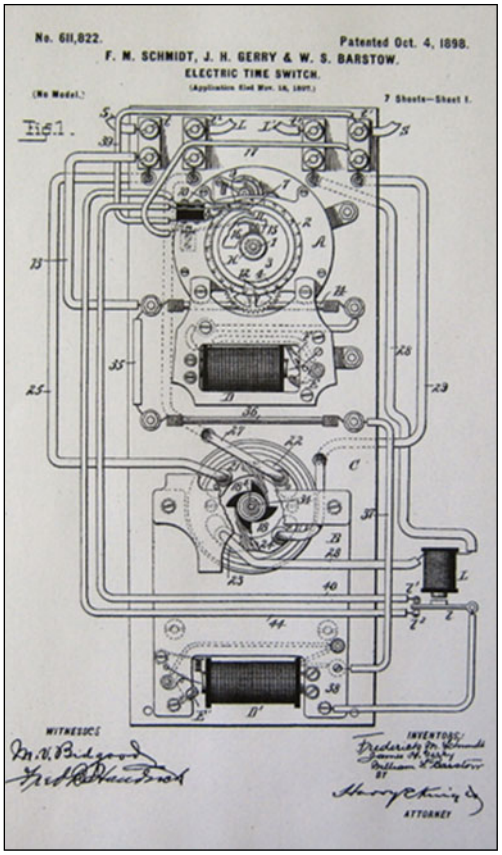
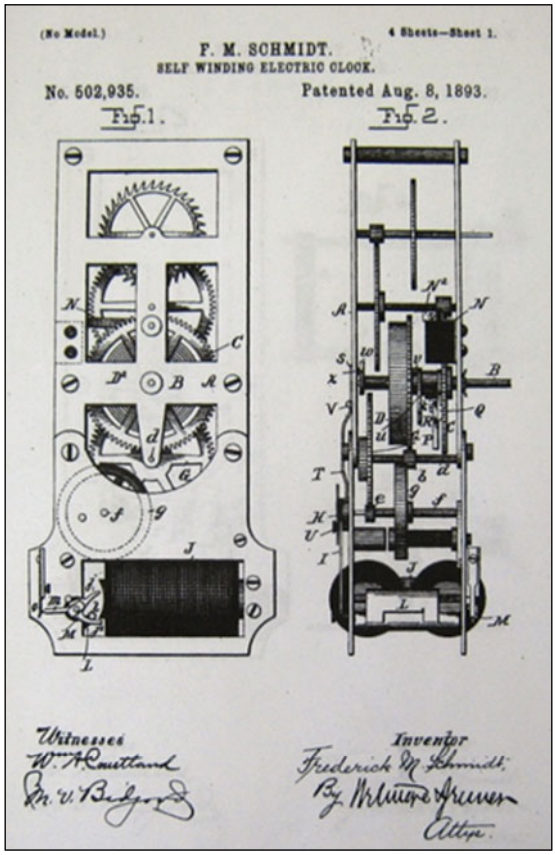


Figure 25, far right. Self Winding Electric Clock patent illustration, 1893. Type "C" vibrator movement, Frederick M. Schmidt inventor.





I have heard speculation that the SWCC Superintendent James H. Gerry was the inventor of the "F" movement. Gerry was born in Massachusetts in 1829. His background was as a head machinist for watchmaking companies. He received a patent for his gravity escapement for clocks in 1883 and at some time after that came to work for SWCC. He was superintendent at the time the "F" self-winding movement was developed and coauthored three patents with Schmidt in that same time period. However, none of those patents were related to the vibrator winding mechanism. At the same time Schmidt was working on the vibrator mechanism, Gerry was involved in perfecting the SWCC synchronizing unit, and he received a patent for an improved synchronizer attached to an SWCC rotary movement in 1897.

The "F" movement must have been put in service around the time of the last patent date of 1898. Schmidt subsequently designed and patented a program clock based on the "F" movement and patented the SWCC slave clock. He must have done the preliminary vibrator motor work prior to joining SWCC and completed the design as an employee of SWCC. It is clear that the vibrator motor and the "F" movement are the work of Frederick M. Schmidt.

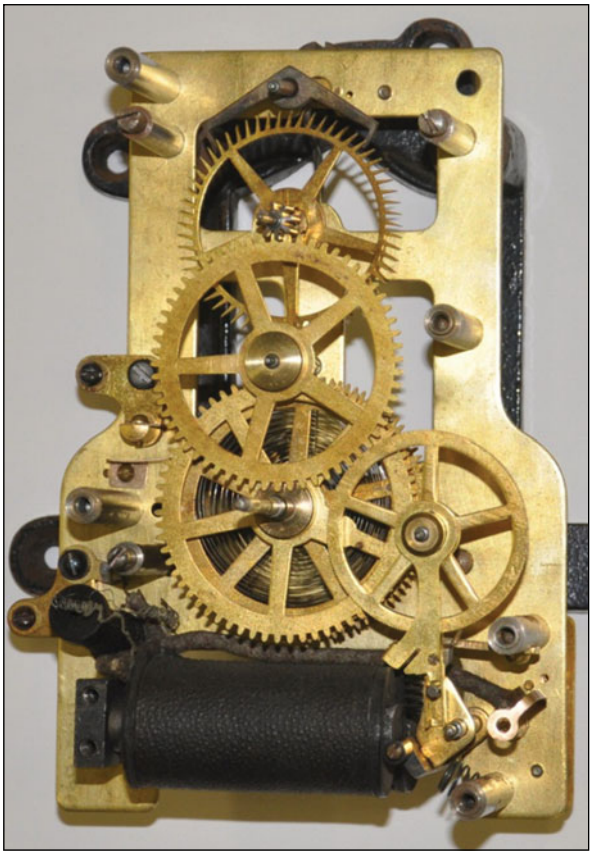


Figure 26, right. Style "F" movement with front plate removed.

The Remarkable Simplicity of the Style "F" Movement

In addition to a reliable winding motor another major improvement in the design of the "F" movement was incorporating both the time train and the motor in one set of plates. It was now possible to remove the front plate, leave the electrical components in place, remove the wheels, and service the clock (Figures 26 and 27). If it was necessary to remove the electrical components, they were very accessible and the electromagnets could even be removed without disassembling the movement (see Figure 28).

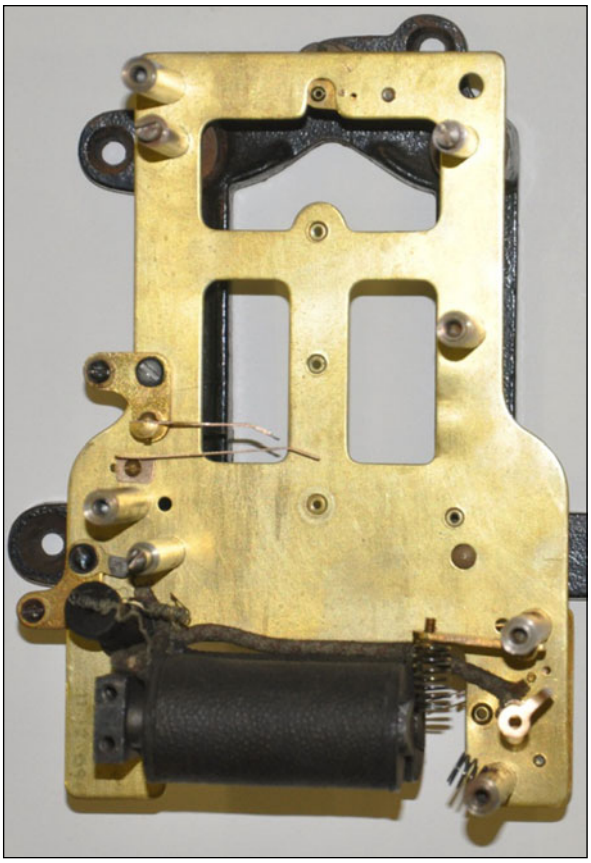


Figure 27, left. Style "F" movement. All wheels removed but coils in place.

Figure 28, right. Style "F" movement with only coils removed.

"F" Serial Numbers and Inventory Tags

Serial numbers stamped on the front plate reveal approximately how many movements were made and, because the numbers appear to have been numbered consecutively, an approximate time of manufacture of the movement can be estimated. This usually does not translate into being able to pinpoint the age of a particular clock by the serial number of its movement. SWCC's routine maintenance procedures often necessitated the movement being exchanged for a factory-rebuilt movement. At the time of replacement, a serial number tag matching the replacement movement was also to be installed in the case, and the tag of the removed movement was to be attached to the removed movement when sent for reconditioning. By following this procedure it is possible to see a clock that may have been made in the late 1930s with a movement that was manufactured in the early 1900s. This movement probably was already installed in an earlier clock(s), returned for reconditioning, and then reinstalled in this clock (Figures 29, 30, and 31). My assumption is that the small "Property of …" plate attached to the left side of the movement was done when the movement was reconditioned at the SWCC factory, and subsequently the movement was installed in a new

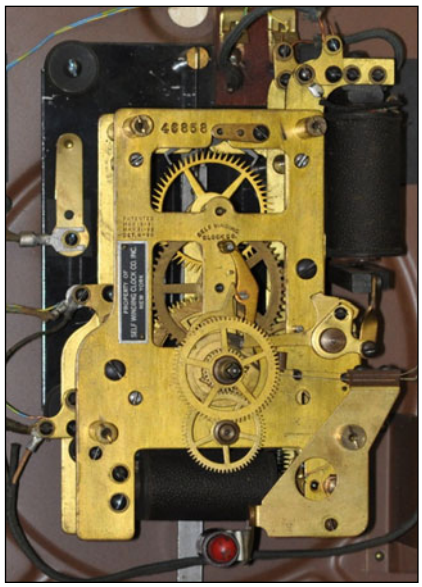


Figure 29, above left. Western Union rental clock, circa late 1930s.

Figure 30, above. Style "F" movement serial number 46858, circa early 1900s.

Figure 31, left. Inventory tag for movement 46858.

rental clock (Figure 32). The tags were for inventory records. Each clock was inventoried as sold, leased, or subleased. Inventory and property taxes were levied against the owner of the clocks.[5] The tag change was not always done as, more often than not, the movement number and the plate numbers do not match.

Most SWCC clocks will have some type of metal plate or paper label attached stating that the clock is "Property

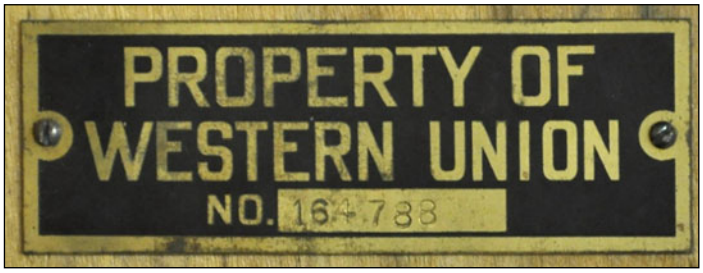


Figure 33, above. Property of Western Union clock inventory tag.

Figure 34, below. Inventory tag of American Telephone and Telegraph Company clock.

Figure 35, below. Inventory tag for customer-owned clock.

Figure 36, left. Synchronized Self Winding dial. Customer owned.

Figure 32, right. Property of SWCC tag on style "F" movement.

Of The Self Winding Clock Company." Some clocks are found with a plate stating "Property of Western Union." These clocks were purchased by WU from SWCC and used in WU facilities (Figure 33). Clocks with brass plates stating SWCC and imprinted with the prefix KS and voltage and movement serial numbers are clocks manufactured for Western Electric (Figure 34) to be used in telephone call timing. A few clocks will have a plate that states "Manufactured by SWCC" (Figure 35) and have a dial that is imprinted Synchronized Self Winding (Figure 36). These clocks were customer owned. The property of Western Union, Western Electric, and customer-owned plates are stamped with the serial numbers of the original movement. It is common here also that the movement may have been changed but not the plate and therefore the numbers do not match.

SWCC-owned clocks, Western Union clocks, Western Electric clocks, and customer-owned clocks were all outfitted with "F" movements.

How Many "F" Movements Were Made and When?

I thought it would be interesting to estimate how many "F" movements were made. Simply calculating the answer from the lowest serial number to the highest serial number does not work. I have seen "F" movements numbered as low as 33,228 and as high as 402,449. Even though the serial numbers appear to be in ascending order, there appear to be several large numbering gaps. These gaps probably resulted from changes in movement designs with the numbering of the new design beginning at an arbitrarily chosen higher round number. This is speculation on my part, from observations I have made, and is clearly subject to revision. It appears that serial numbers for "F" movements start about 33,000. The earliest movements were stamped with three patent dates, and these movements were numbered in the 63,000s. "F" movements with just the 1898 patent date number from the 63,000s to about 220,000. There then appears to be a large numbering gap, because movements with the FR prefix start at 300,000 but only continue to about

302,000. Another large numbering gap appears, and the final version of the "F" style movements appears to be in the FR 400,000 to 402,000 range. By using these numbers, the total "F" movements made is probably in the neighborhood of 200,000.

When were these "F" movements made? The earliest movements must have been made some time just after the last patent was issued, so probably by late 1898 or early 1899. Ward Goodrich in his classic, *Modern Clock*, published in 1905, estimated that SWCC has upwards of 67,500 clocks in service.[6] In 1981 J. J. Singer observed, using a picture in the 1908 SWCC catalog, that movements with serial numbers 63,132 and below were manufactured during or prior to 1908. A 1917 parts catalog pictured movement number 112,956. Therefore, it and numbers below were manufactured in or prior to 1917. A 1929 catalog picture reveals that movements below 196,212 were made in or prior to 1929.[7] Another piece of information on SWCC movement serial numbers and dates of manufacture comes from a fascinating article about SWCC clocks in a seemingly unlikely place, the London Underground. About 600 SWCC clocks were installed in the London Underground, starting in 1905. An American entrepreneur and property speculator, Charles Tyson Yerkes, with experience in construction of urban railway and tramways in the United States, headed a syndicate that bought interests in several London "tube" railways. The American engineers brought in by Yerkes specified clocks manufactured by the Self Winding Clock Company of New York to be installed throughout the system. The clock movements were 120-beat style F1/2. The serial numbers of the London Underground SWCC clocks purchased between 1905 and 1908 are numbered 47xxx to 51xxx. The author speculated that there must be some movements in the 111xxx range that were installed in a 1910-1912 underground extension. The later clocks in the system are in the range of 178xxx to 196xxx. He placed the last batch as being purchased about 1929.[8] These serial numbers and dates of manufacture agree with Singer. The conclusions drawn are shown below.

(1) Movements with S/Ns below 63,132 were manufactured during or prior to 1908.

(2) Movements with S/Ns below 112,956 were manufactured during or prior to 1917.

(3) Movements with S/Ns below 196,212 were manufactured during or prior to 1929.

The earliest "F" plates had patent dates of 1891, 1892, and 1898 along with the serial number. These serial numbers appear to start at about 33,000 and the highest serial number on a three-date plate that I have seen is 63,220 (Figure 37). The lowest serial number of a plate with only the 1898 date that I have seen is 63,526 and the highest is 210,731 (Figure 38). It is possible the earliest two patent dates were omitted, as production continued near or past the 17-year limit on patent enforcement. This may also explain why the 300,000 and 400,000 plates did not include any patent dates (Figure 39). The 300,000s I have seen start at FR 300,178 and the highest I have seen is 301,151. Another block of plates start at FR 400,000. The numbers I have seen range from FR 400,320 to FR 402,449. It would be interesting to know when these last plates were made and what the prefix FR means.

Movement serial numbers observed to date:

		LOW		HIGH
(1) Movements patented 1891, 1892, and 1898.	Serial numbers	33,228	to	63,220
(2) Movements patented 1898	Serial numbers	63,526	to	210,731
(3) Movements - no patent dates	Serial numbers	FR 300,178	to	FR 301,151
(4) Movements - no patent dates	Serial numbers	FR 400,320	to	FR 402,449

Figure 37. Earliest style "F" plates have 1891, 1892, and 1898 patent dates and serial number.

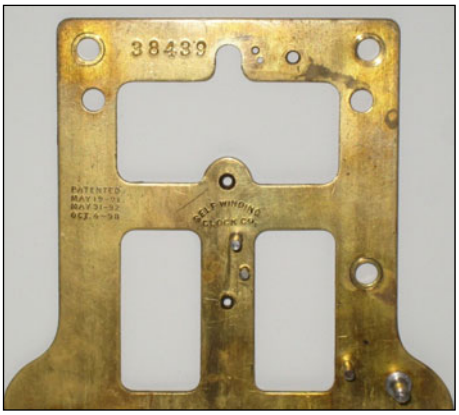


Figure 38. Later style "F" plate with 1898 date and serial number.

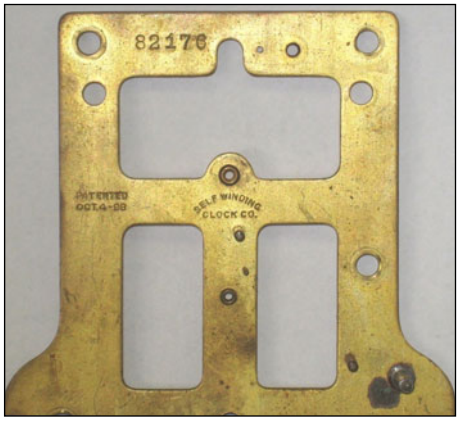
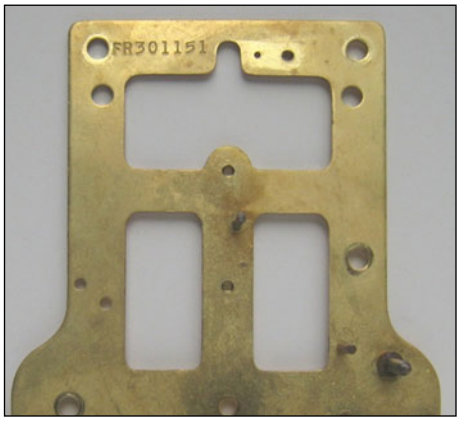


Figure 39. Latest style "F" plates have no patent date but have serial numbers with prefix FR.



The Self Winding Clock Company and Western Union

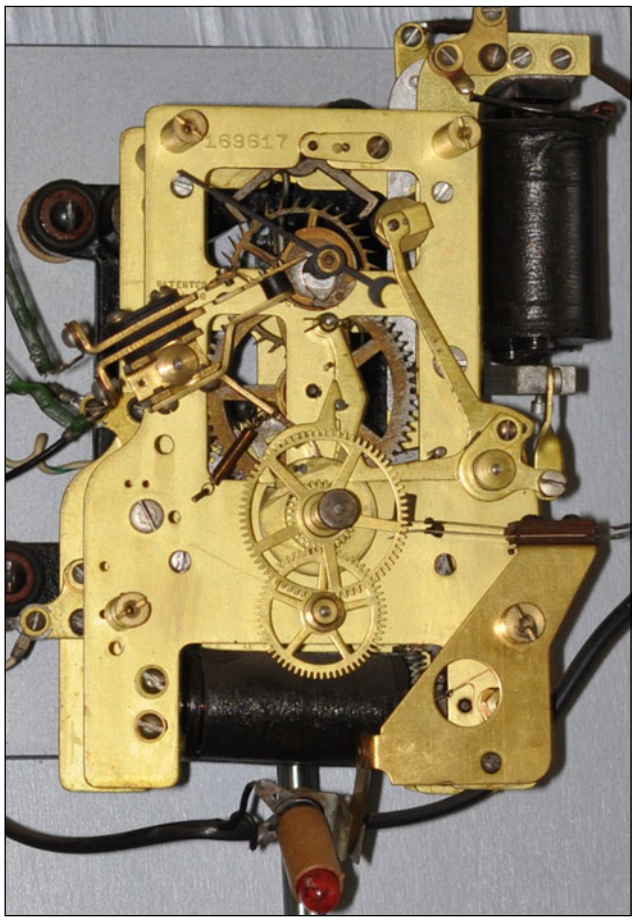
Because so many SWCC clocks that we see today were originally owned by or used as rental clocks by Western Union, it seems appropriate to include some company information here. The relationship between the SWCC and Western Union has been explored in many articles, and timelines for the joint ventures still seem to be subject to revision. The relationship between the two separate companies began with an agreement between them being entered into in June 1889.[9] This agreement was for the transmission of time signals over Western Union telegraph lines to synchronize clocks made by the SWCC. The SWCC owned the clocks and WU installed and maintained them for a monthly rental fee, ranging from $1.25 to $2.00 per clock per month. SWCC was paid a percentage of the rental fee for the use of their clocks. Being two separate companies probably ended in 1963 when Western Union, as part of a lawsuit settlement, purchased the rental clocks from the Self Winding Clock Company.[10] WU continued to operate the time service business through the late 1960s, but by then the quality of maintenance had begun to decline. In the 1920s, 1930s, and 1940s WU actively promoted their monthly rental time service and introduced new models with new features. By 1940 there were 100,000 subscriber clocks in service, but after World War II the interest in contracting for a monthly time service began a steady decline to extinction. Almost all of the Western Union clocks were equipped with the "F" movement. The manufacture of parts for these movements had been discontinued by 1966, and any replacement parts were salvaged from other movements.[11] By the late 1960s the time service business had run its course and ceased to be profitable. Western Union apparently quit collecting monthly rent and most clocks were simply abandoned.[12] Many of the clocks ended up with employees and even today these clocks continue to reappear on the collector market.

The "F" movement is amazingly durable and reliable. This must have been evident to other clock manufacturers, for the "F" design was emulated by other electromechanical clock companies. A version of the vibrator winding motor was used by the Blodgett Clock Company and Stromberg Electric Company on some of their master clock movements, and the "F" plate design was used by Stromberg Electric Company and the Holtzer Cabot Company for their master clock movements.

The "F" movements were installed in SWCC clocks from about 1898 through the 1960s. The movement was used as a single timepiece, part of a synchronized time system and in master clocks to transmit hourly correction signals (Figures 40 and 41).

Figure 40, left. Model 61 SWCC master clock, circa 1960.

Figure 41, below. Style "F" movement from model 61 with contact (left) to send hourly synchronizing signal.



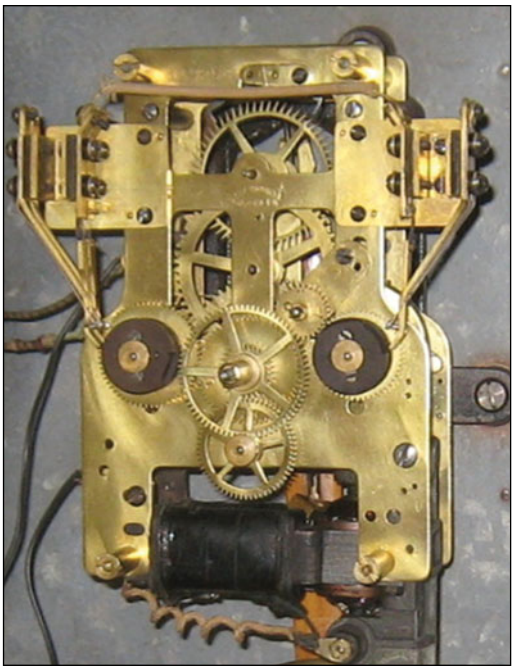


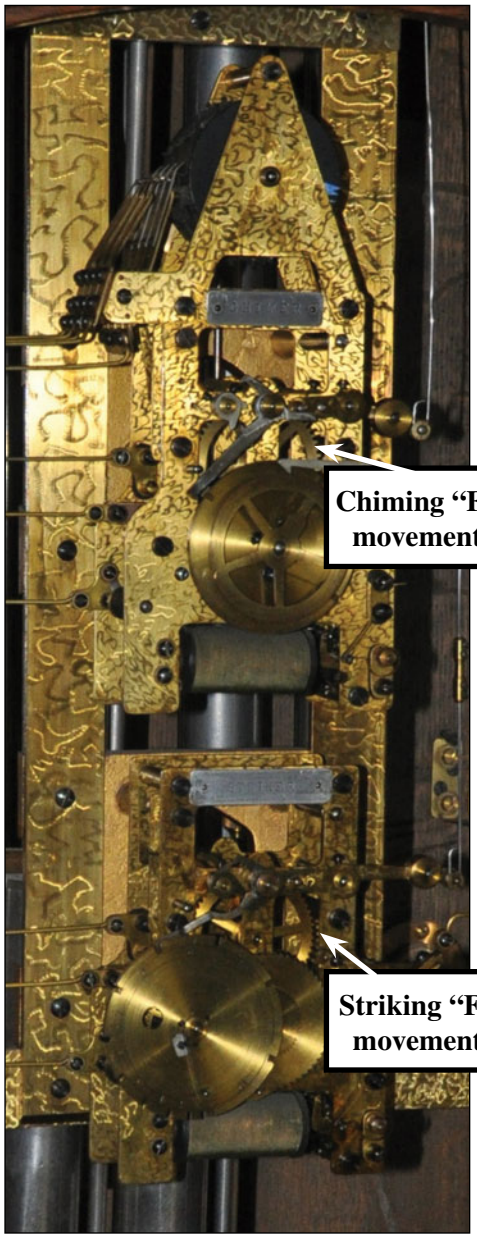
Figure 42, far left. Model 10A SWCC utility program clock, circa 1930.

Figure 43, left. Style "F" movement from model 10A modified to close electrical circuits. A more powerful, conventional, armature-type winding rotor is used here.

Figure 44, below left. SWCC tallcase master clock, circa 1910.

Figure 45, below right. Two style "F" movements from tallcase clock. Top style "F" runs chiming mechanism, and bottom style "F" runs striking mechanism.

The movement has been adapted to time circuit closers for lighting systems (Figures 42 and 43) and two separate "F" movements have even been adapted to power the chime and strike trains of an elegant SWCC tallcase master clock (Figures 44 and 45). The "F" movement has proven to be a reliable workhorse that requires minimal attention. The time train portion of the movements are uncomplicated in construction and fortunately the parts are readily interchangeable. The electrical components can be intimidating, but one does not need to be an electrical engineer to service the movement. Most of the time, the electrical components require minimal if any adjusting. For someone who has never disassembled and serviced one of these movements the ideal situation is to have a complete fully functioning second movement at your side to serve as a prototype while reassembling. The parts of the hourly contact on the center shaft and the positioning of the winding lever can be confusing and with an assembled example available the parts will more comfortably go into place. This also will guide the correct positioning of the coil wires. There are many very helpful sites on the Internet. A Google search under Self Winding Clock will provide much useful information. A copy of the very comprehensive 1945 SWCC Model "F" Movement Technical Manual can be found at www.kensclockclinic.com, go to Library and then click on Historical Documents. It is listed as Self Winding Clock Co. Service Guide.



About the Author

Alan Bloore is a retired orthodontist and has collected electromechanical clocks for 40 years. His primary interest is in clocks that are part of synchronized time systems. He has several master clocks and secondary (slave) clocks installed in his home and he keeps his clocks running at all times. He has been compiling a list of SWCC movement serial numbers in an attempt to approximately date the time of manufacture. In some instances this can help to date individual clocks and establish originality. These are preliminary observations and certainly subject to revision. More information is needed and if anyone can provide serial numbers, which will increase or decrease the highs or lows published here, it will help to establish manufacturing totals. Copies of any manufacturing or maintenance documents are solicited and would be greatly appreciated. He previously authored the "School Clock Systems of The Standard Electric Time Company" published in the April 2011 *Watch & Clock Bulletin* and "Bad Robot Clock System: A Mid-Century Clock System in a High-Tech Setting" published in the October 2011 *Watch & Clock Bulletin*. Alan has been a member of the NAWCC since 1979 and is currently secretary of Western Electrics Chapter 133. He can be reached at jabloore@aol.com.

Acknowledgments

Thank you to Les Lesovsky and David Rooney for help in trying to accurately chronicle the relationship between the Self Winding Clock Company and the Western Union time-service business. Thank you also to Ken Reindel for help verifying technical details of the "F" movements.

Notes

1. "Instructions for Installation and Maintenance of Self-Winding Synchronized Clocks," *Self Winding Clock Company* (Brooklyn, NY: SWCC, 1923): 20.
2. Tran Duy Ly, *American Clocks,* Vol. 2 (Fairfax, VA: Arlington Books, 1995): 184.
3. *Scientific American,* Architects and Builders edition (July 29, 1893).
4. W. L. Goodrich, *The Modern Clock* (Chicago: Hazlitt & Walker, 1905): 405.
5. Western Union Telegraph Company "Time Service," *Commercial Bulletin,* No. 46-B (New York, NY: Western Union, 1931). 26.
6. W. L. Goodrich, 399.
7. J. J. Singer, "Request: Self-Winding Clock Co.," *NAWCC Bulletin,* No. 210 (February 1981): 70.
8. D. Burton, "Timekeeping on the London Underground," *NAWCC Bulletin,* No. 321 (August 1999): 457.
9. I. R. Bartky, *Selling The True Time* (Stanford, CA: Stanford University Press, 2000): 273.
10. M. W. Bartels, "The Self-Winding Clock Company and The Western Union Service," *NAWCC Bulletin,* No. 191 (December 1977): 632.
11. Western Union, Interoffice communication (Chicago, IL, 1966).
12. M. W. Bartels, 317.

Additional Resource

Western Union, *Time Service-Clocks-Maintenance and Repair* (Indianapolis, IN: Western Union, 1968).

2011 NAWCC Award Recipients Regional Recognition

Please see the March/April 2012 *W&C Bulletin* for a listing of all other 2011 regional certificate awards.

Mid-Eastern Regional

Gold
Richard S. Robinson (VA)
Michael W. Tyler (VA)

Chapter Citation
Philadelphia Ch. 1
Washington DC Ch. 12
Carolina Ch.17
Shenandoah Valley of Virginia Ch. 32
Old Dominion Ch. 34

Regional Appreciation
Mark Cardona (VA)
Diana Chapman (VA)
Judy Draucker (VA)
Edwin L. Fasanella (VA)
Hayward Glaspell (VA)
Vern L. Holman (VA)
J. Steven Humphrey (PA)
Stan Palen (VA)
Lori Robinson (VA)
Dean Sarnelle (VA)
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Myrna Shirah (VA)
Larry Taylor (VA)
Janet L. Tyler (VA)
James Wynne (VA)