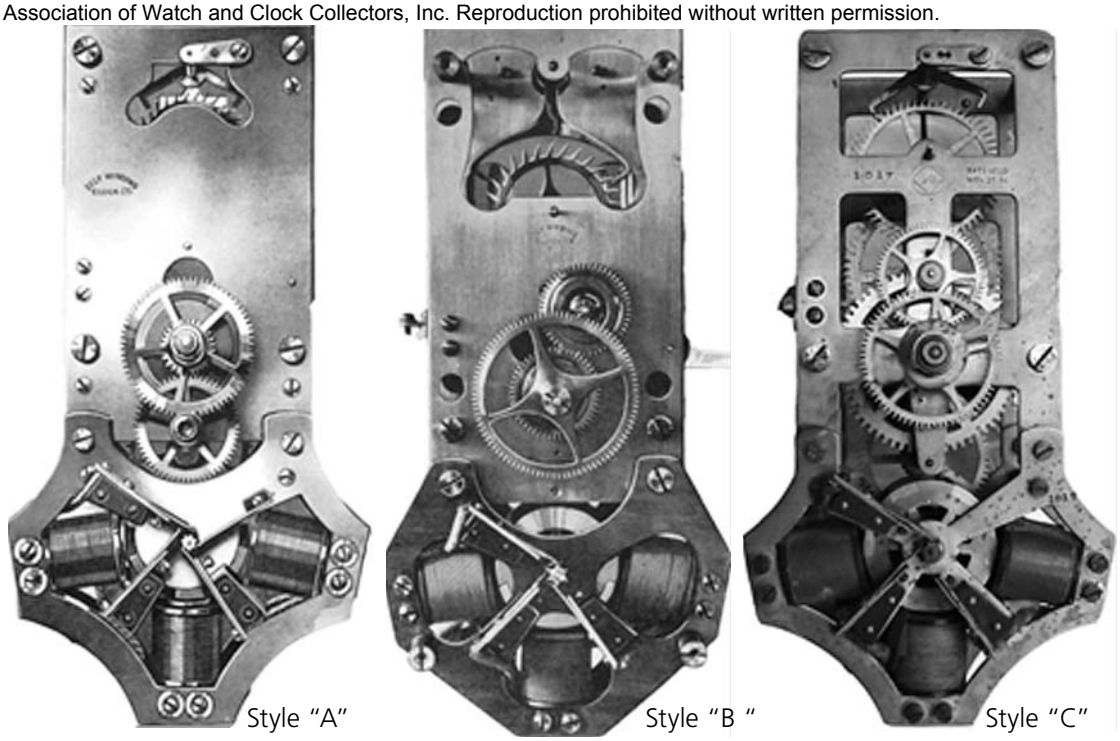
The ABC's of the Self Winding Clock Company's Rotary Movement

by J. Alan Bloore (CA)



Style "A" Style "B " Style "C"

The very progressive Self Winding Clock Company clocks came on the market in 1886 and were equipped with movements that included a unique electrically powered rewind motor, which eliminated the need to manually wind the clock's mainspring. The clocks were more expensive than "windup clocks," but "you never had to wind them." The movement consisted of a conventional time train above with an electric motor mounted below. The movement was termed the rotary movement. The clocks were, as the company's name suggests, truly self-winding. The movements were based on a patent issued to one of the founders of the Self Winding Clock Company, Chester Pond, on November 25, 1884, for a clock mechanism titled "Electro Mechanical Clock".[1] A small electric motor incorporated into the clock mechanism rewinds the clock mainspring one revolution each hour. A switch is activated as the movement unwinds and automatically starts the hourly self-winding process. The winding motor is powered by 3 volts DC and the batteries last for at least one year.

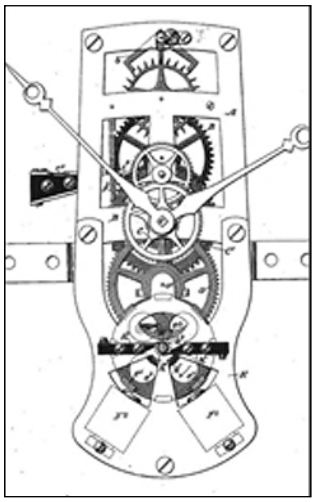


Figure 1. Patent drawing of Pond's electromechanical clock, 1884, showing a 2-magnet motor.

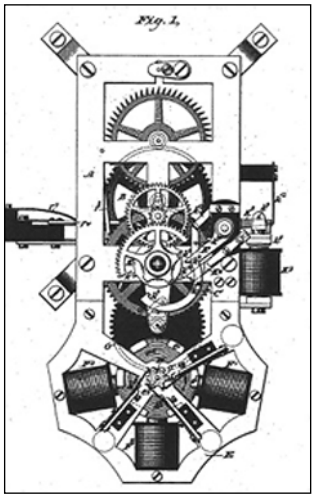


Figure 2. Patent drawing of Pond's synchronizing device for clocks, showing a 3-magnet production model rotary motor; patent was applied for in 1885 and granted in 1886.

Pond's original patent drawings illustrate the winding motor as having two electromagnets, rather than three, powering the rotor that winds the mainspring. The patent description, however, states that "… two or more electromagnets are employed for propelling the armature" (Figure 1). By June of 1885 Pond had submitted another patent application for a "Synchronizing Device For Clocks"[2] in which the winding motor illustrated was the familiar 3-magnet rotary motor (Figure 2). This winding motor design seems to have been used exclusively through the early 1890s, at which time at least two different attempts were made to develop alternative winding motors for the rotary movement. This eventually led to a new design of Self Winding Clock Company movement by 1898. However, the 3-magnet winding rotary movement continued to be used in selected applications for many years.

The Self Winding Clock Company (from now on referred to as SWCC) made a few different styles of self-winding movements, and they simply named the style of the particular movement by letters of the alphabet. How-

ever, the sequence of letter names is somewhat puzzling, for the names do not follow a simple sequence. (It worked for Henry Ford when the model A followed the model T). In 1886 the movements that powered the earliest clocks were termed either a style "B" or style "C" movement. Then a style "A" movement appeared in the mid-1890s. There also was a heavy-duty style "E" movement that was designed to be used specifically in clocks with very large dials. A "D" designation was never used. And by the late 1890s the company introduced the style "F" movement. The style F movement was completely redesigned, and a very reliable rewind motor replaced the rotary rewind motor. The SWCC would use the style F movement in clocks for the next 60-plus years. (See the May/June 2012 *Watch & Clock Bulletin* for my article, "The Self Winding Clock Company and the Ubiquitous Style F Vibrator Movement, pages 250-262.) Up until the late 1890s the style A, style B, or style C rotary movements were used in almost all SWCC clocks (Figures 3-5). In a few instances other SWCC movements, which were also wound hourly by a rotary motor, were used in selected applications.

The earliest known catalog of Self Winding Clock Company clocks is the *American Manufacturing and Supply Company Limited of New York* catalog of 1887.[3] There is an illustration of the "Under Pond Patent" C movement in the catalog. The text states that clocks are usually outfitted with a C movement but for an additional $35 the clock could be equipped with the higher-grade B movement.

Most of the early SWCC clocks were equipped with the open-plate style C rotary movement, and only the more expensive clocks had the higher grade style B movement. The style C movements were made by Seth Thomas, and the style B movements were made by E. Howard. SWCC then added the rotary winding motor and electrical contact components. The B and C motor plates are also slightly different, and it appears that Seth Thomas must have provided the winding motor plates for the C movements, and E. Howard must have provided the winding motor plates for the B movement. The style A movements were made with solid plates and by that time SWCC was apparently manufacturing its own movements (Figure 6).[4] There is a considerable amount of confusion about the difference between the later style A rotary movement and the earlier style C rotary movement. Unfortunately, this primarily stems from an incorrect caption on page 199 of *American Clocks*, volume two, by Tran Duy Ly, in a large section on the SWCC, which contains numerous illustrations interspersed from several different SWCC catalogs of different years. On page 199 there are side-by-side illustrations of two rotary movements: a style C from the 1887 catalog and a style A from the 1898 catalog. The illustrations should have been individually titled, but instead, one title under both illustrations says "Style A Self-Winding Movement." They are not the same movement and even though it seems strange, the "style C" predates the "style A."

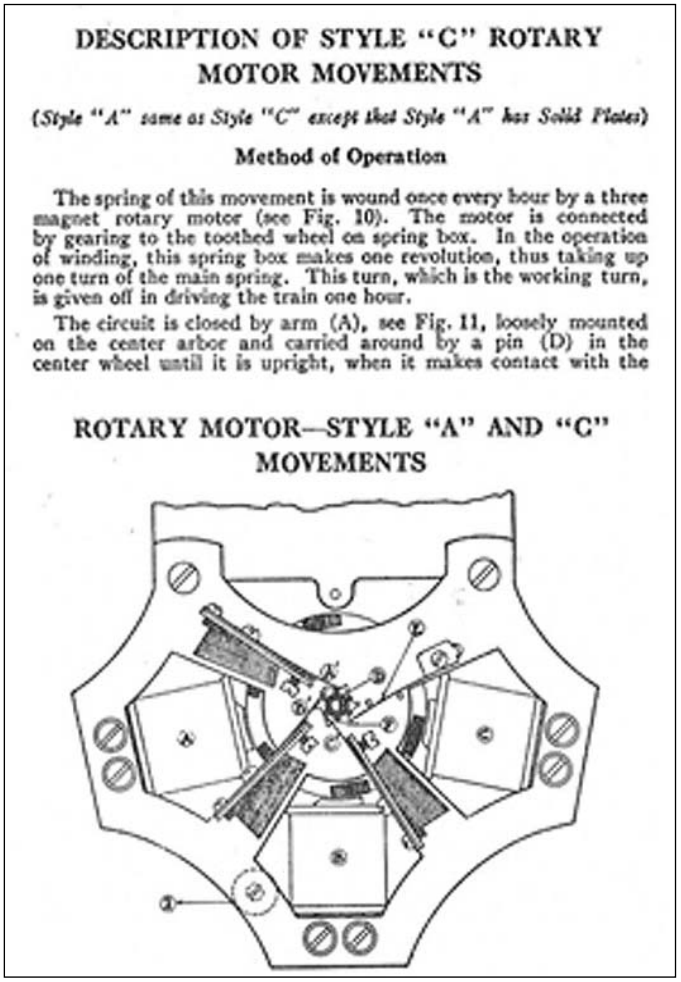
C Rotary Movements Serial Numbers and Patent Dates

By far the most rotary movements are of the style C, open-plate type. All the C movement plates are stamped

Figure 3. Style A movement.

Figure 4. Style B movement.

Figure 5. Style C movement.



DESCRIPTION OF STYLE "C" ROTARY MOTOR MOVEMENTS

(Style "A" same as Style "C" except that Style "A" has Solid Plates)

Method of Operation

The spring of this movement is wound once every hour by a three magnet rotary motor (see Fig. 10). The motor is connected by gearing to the toothed wheel on spring box. In the operation of winding, this spring box makes one revolution, thus taking up one turn of the main spring. This turn, which is the working turn, is given off in driving the train one hour.

The circuit is closed by arm (A), see Fig. 11, loosely mounted on the center arbor and carried around by a pin (D) in the center wheel until it is upright, when it makes contact with the

ROTARY MOTOR—STYLE "A" AND "C" MOVEMENTS

Figure 6. SWCC instructions, page 20, 1923. "Style A has solid plates."

with a serial number, patent dates, and a company logo or name. Throughout production serial numbers seem to increase arithmetically and sequentially. There are a few exceptions where blocks of numbers are left unused. The rotary movement serial numbers seem to have started with double-digit numbers and went through the 18,000s and possibly somewhat higher. All these movement plates had a November 25, 84 (1884) patent date, which refers to Chester Pond's patent for an "Electro Mechanical Clock." When compiling serial number data, there appears to be a large numbering gap and then the serial numbers start again around 25,000 and continue through the 27,000s or 28,000s. On these plates the 1884 patent date has been eliminated, and two new patent dates, MAY 19 - 91 (1891)[5] and MAY 31 – 92 (1892),[6] have been added. These dates refer to patents granted to Frederick M. Schmidt of Brooklyn, NY, for "Self Winding Clock" and "Electric Self Winding Clock." Each of these patented clock movements contains one component of a new winding motor that was subsequently also patented by Frederick M. Schmidt. The change in patent dates indicated that SWCC thought these improvements in winding motors needed to be protected. More about this motor follows under Style C Vibrator Movement.

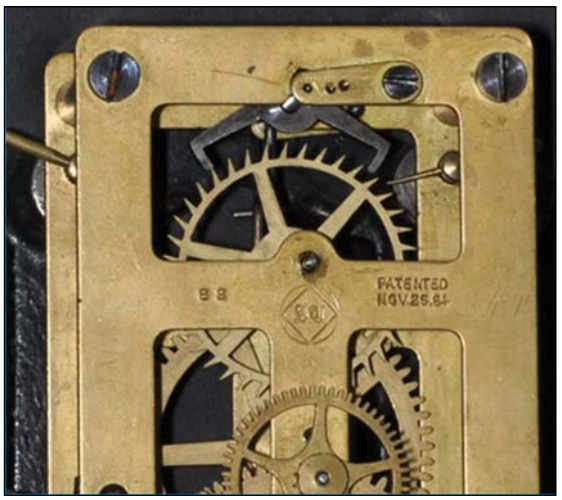


Figure 7. Style C type 1 plate.

Four Types of Style C Plates

The earliest style C movements were attached to the mounting bracket with four pins rather than screws. On the front plate, from left to right, were stamped the serial number, a Seth Thomas logo under the escape wheel arbor, and Patented Nov 25, 84 (1884). This was all stamped on the middle section. I have termed these style C rotary-movement plates, "type 1" (Figure 7). The pictured movement is in an SWCC model 32, 80-beat clock (Figure 8). On type 1 style C movements the minute wheel is mounted above the center shaft. On later types the minute wheel was moved down below the center shaft to make room for a synchronizing mechanism. These movements were equipped with the first-generation rotary motors, and the motor serial number would have been the same as the movement number. The rotary motors will be discussed later. I have seen these movements with serial numbers from 82 through 1,275.

Figure 8. SWCC model 32.

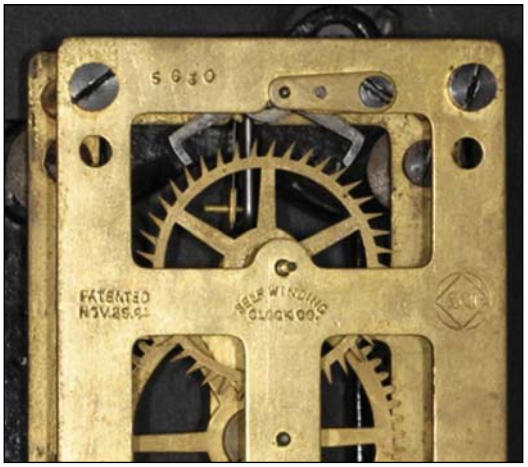


Figure 9. Style C type 2 plate.

Figure 10. SWCC model 8.

Figure 11. Style C type 3 plate, with USA added to Seth Thomas logo.

The next style C movements were attached to the mounting bracket with four cheese-head screws. On the front plate at the top left is stamped the serial number. On the middle, from left to right, are stamped patented Nov 25, 84. Self Winding Clock Co., under the escape wheel arbor, and the Seth Thomas logo. I have termed these style C plates, "type 2" (Figure 9). This movement is in an SWCC model 8, 84-beat clock (Figure 10). Serial numbers for type 2 rotary movements that I have seen run from the 1,300s to 5,800s. The rotary motor would also have had the same serial numbers as the clock case and the movement.

The next style C movements were attached to the mounting bracket with four cheese-head screws or four, simpler to handle, long pillar screws. On the front plate at the top left, in larger characters, is stamped the serial number. On the middle, from left to right, are stamped Patented Nov 25, 84 (1884), Self Winding Clock Co. under the escape wheel arbor, and the Seth Thomas logo, now with USA under the diamond. I have termed these style C plates, "type 3" (Figure 11). I have seen type 3 rotary movement serial numbers from 8,000s to 18,000s. The motors appear to be both the conventional 3-pole motor and a short-lived, redesigned, 2-pole motor.

The Style C Vibrator Movement

The next style C movements were not powered by a rotary motor but by a new vibrating type of rewind motor, hence are termed the style C vibrator movement. The clock mechanism is exactly the same as the rotary movement, but the winding motor is completely redesigned. The style C vibrator movements were also attached to the mounting bracket with long pillar screws. In this instance the plate marking changes appear to be correlated directly to changes in the clock winding rotor. On the front plate at the top left is stamped the serial number. In the middle, on the left, are the two new patent dates, Patented MAY 19 – 91 (1891) and MAY 31 – 92 (1892), and under the escape wheel arbor is Self Winding Clock Co. The Seth Thomas logo is not included, because as of 1892 the Self Winding Clock Company must have been manufacturing its own movements. I have termed these style C plates, type 4 (Figure 12). This movement is in an SWCC model 29, 120-beat clock (Figure 13). These patent dates relate to the development of the style C vibrator motor, which was intended to replace the rotary winding motor. This vibrator winding motor led directly to the development of the style F movement by Frederick M. Schmidt. Within a few years the style F movement would be the movement of choice, and the style C movements would no longer be manufactured. I have seen type 4 movements with serial numbers from 25,000 through the 27,000s.

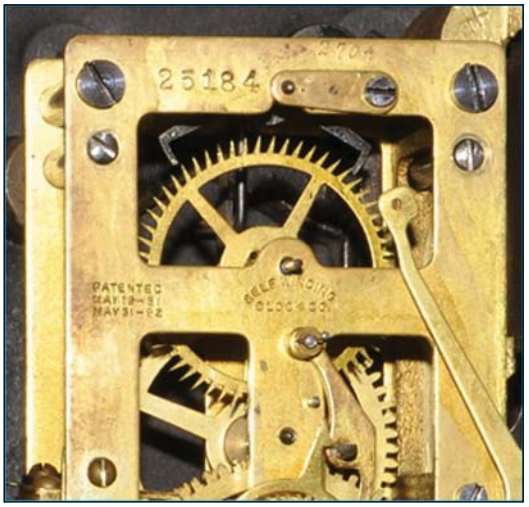


Figure 12. Style C type 4 plate.

Figure 13. SWCC model 29.

Exceptions to Preliminary Observations

Not all style C plates fit the type 1 through type 4 designations.

So far I have seen only one plate that does not fit into one of the four types. On this plate a patent date of Nov 25-84 and Self Winding Clock Co. are stamped at the sides of the escape wheel arbor and apparently there is a serial number at the top (Figure 14). This may have been made by SWCC, hence no Seth Thomas logo. The serial number may have been ground off to keep this movement out of inventory.

Figure 14. Style C plate that does not fit any type.

Some Serial Numbers Seem out of Sequence

Figure 15 shows a rotary movement with the matching serial numbers of 1981 that did not fit into the numbering and manufacturing sequence. The movement and motor had all the characteristics of an early type 1 movement, but the serial numbers indicated otherwise. On closer examination of the serial number stamps, it became obvious that the movement and motor were renumbered by stamping a 1 before and after the number 98. Hence, the movement is really number 98 and not 1981. My suspicions were confirmed when I came across movement number 1991 (99) with exactly the same components.

This does not mean there won't be other inconsistencies, but at least here there is an explanation.

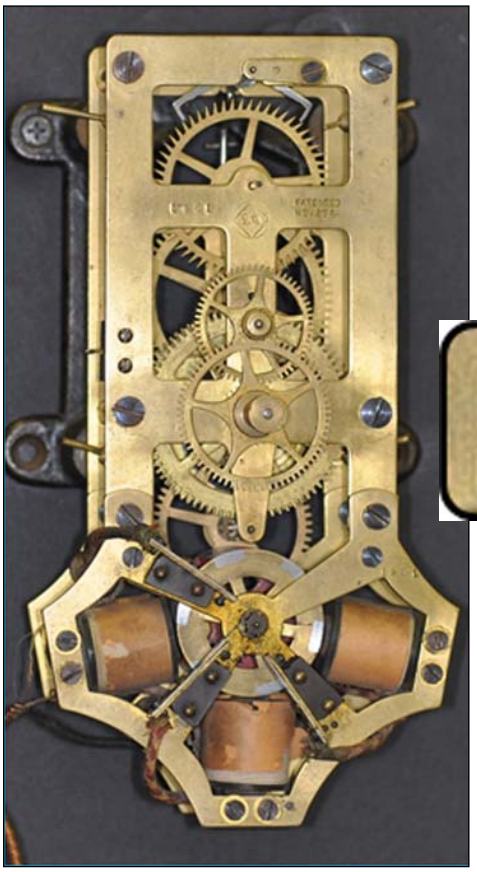


Figure 15. Early style C type 1 number 98 with renumbered higher serial number.

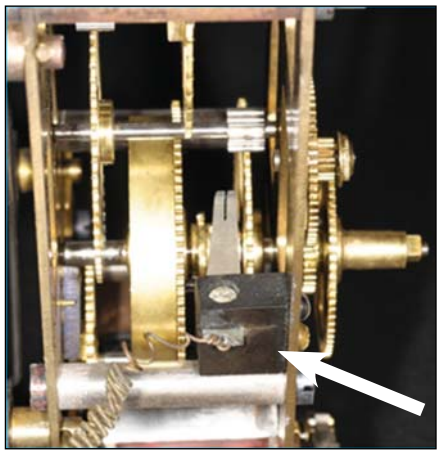
Improvements in the Style C Rotary Movement

The spring of the rotary movement is wound once every hour by the 3-magnet rotary motor spinning a rotor with six armature bars. As experience grew, the movements were improved, but there is not enough information to confirm whether these improvements were installed at the same time as the movement plates were changed.

The first movements were connected to the mounting bracket with pins. For easier access the pins were replaced with cheese-head screws and then further improved by the simpler to use, long pillar screws.

The hourly wind switch was made more reliable. The hourly wind switch is attached to the front plate and makes contact with an arm that revolves hourly on the center shaft. The earliest rotary movement hourly wind switches were made of an insulated block holding a single contact arm. The lead wire must be soldered to the contact arm (Figure 16). Later, the hourly switch was made of brass with two contact arms, which made better contact with the frame and a more reliable contact with the rotating arm on the center shaft. A terminal screw was provided to attach a lead wire (Figure 17). It is not uncommon to see an early movement with an upgraded hourly contact switch.

The earliest rotary motors used a stop click to prevent the armature drum from turning backward and unwinding the mainspring. It is attached to the movement backplate and stops the intermediate wheel from moving. This was necessary on the first generation of rotary motors but not needed when the rotary motor was redesigned.



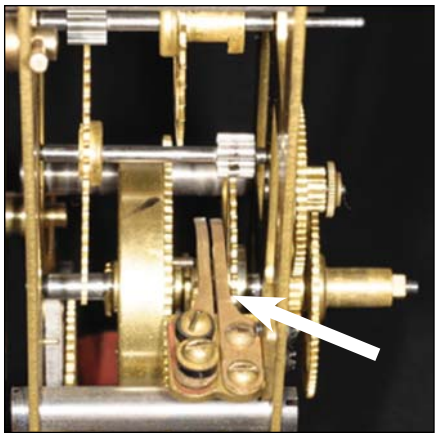


Figure 16, above left. Early hourly contact switch.
Figure 17, left. Late hourly contact switch.

Self-Winding Motors

The reliability of the self-winding motor is critical to the successful operation of these clocks. The clock motor must restart each hour to rewind the mainspring. It appears that there was always a quest to improve the reliability of the winding motor.

The first-generation rotary-winding motor plates were less substantial than the second. The round, rotating armature drum has six bars, and the rotor's side plates are flush with the bars (Figure 18). The mainspring was prevented from turning the armature backward and unwinding with a stop mechanism mounted on the backplate of the time portion of the movement. The second-generation rotary motor did not have a stop on the movement but used a backstop spring mounted directly on the front plate of the rotary motor. Here the drum is narrower and the armature bars project past the drum (Figure 19). Each motor version, on the front of the armature drum, has a six-point commutator corresponding to the six armatures in the drum. The commutator on the later version also has six notches on the edge that prevent the mainspring from unwinding when the rotating armature drum is locked in place by the backstop spring. Both versions of the motor have three insulated blocks that hold the leaf springs for each magnet pair. They are attached to the front motor plate with rivets. On the earlier motors the rivets are flush with the blocks, but on the later motors the rivets are recessed. The method of connecting leads to the motor wires was also improved, because a terminal was added to the late motor. Previously, the three coil wires were simply twisted together.

The first-generation rotary motors had serial numbers stamped on the upper right side of the front plate. This number would be the same as the movement number and the case number. I have seen numbers as low as 82 and as high as 1,275. Many of the second-generation rotary motors also had serial numbers, but it appears that many of the second-generation motors were not marked with serial numbers. I have seen numbers as low as 1,437 and as high as 7,326. It is very common to see movements paired with motors of a different serial number or no number. It is rare to see matching numbers. More often than not, early rotary movements eventually were powered by later rotary motors.

Search for a Replacement for the Rotary Motor

In the early 1890s a search for a more reliable winding motor took two distinct and different directions. One attempt was to remake the rotary motor with just two pairs of coils, and the other attempt was to develop a winding motor with one pair of coils but use a vibrating arbor rather than a rotating arbor.

It is commonly assumed that a 2-pole rotary movement would be an early first-generation movement; however, although the Pond patent drawing for his original self-winding clock does show a movement with a 2-pole motor, there are no known examples of this illustrated movement. All of the early movements came with the 3-pole motor. But in the early 1890s SWCC did manufacture a 2-pole motor (two pairs of coils) reminiscent of the 2-pole motor illustrated in Pond's patent drawings of 1884. This new 2-pole motor was illustrated in a publication about the SWCC exhibit at the 1893 Chicago's World Fair (Figure 20).[7] On this 2-pole motor the insulated blocks, the brushes, the notched commutator, and the backstop spring of the 2-pole motor have all the same characteristics of the second-generation 3-pole rotary motor (Figure 21), indicating this 2-pole motor was not manufactured anywhere near the 1884 patent date. The 2-pole motor included a small lever that could be manually activated to spin start the rotor if the movement failed to start the hourly rewind process. The 2-pole motor plates are not numbered. I have not been able to establish if this motor was installed in a significant run of clocks with consecutive serial numbers or approximately how many of the 2-pole motors were made. In any event this motor appears to have been a short-lived experiment and was not an improvement.

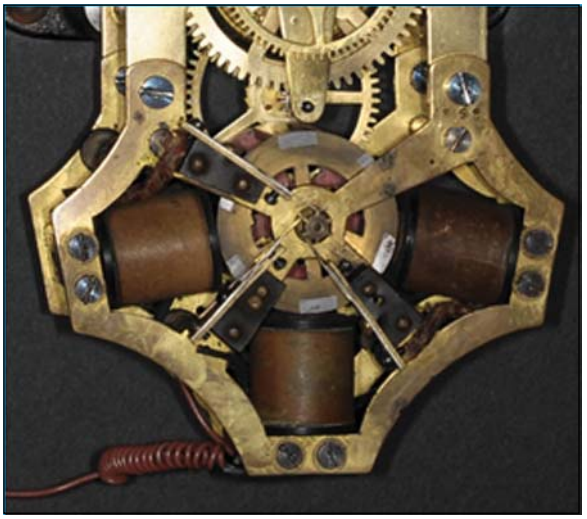


Figure 18. Early rotary motor.

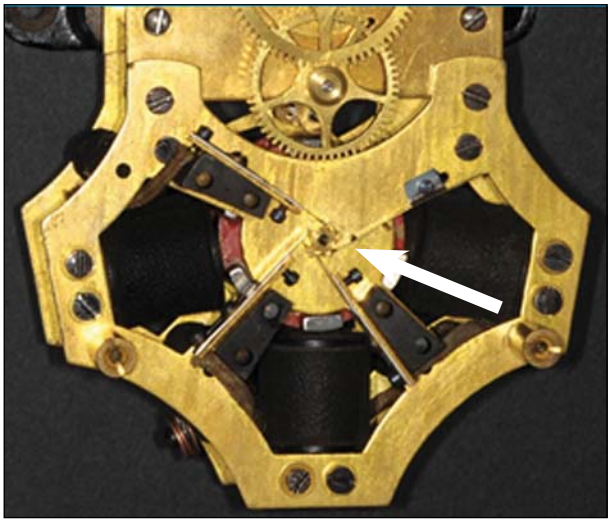


Figure 19. Late rotary motor.

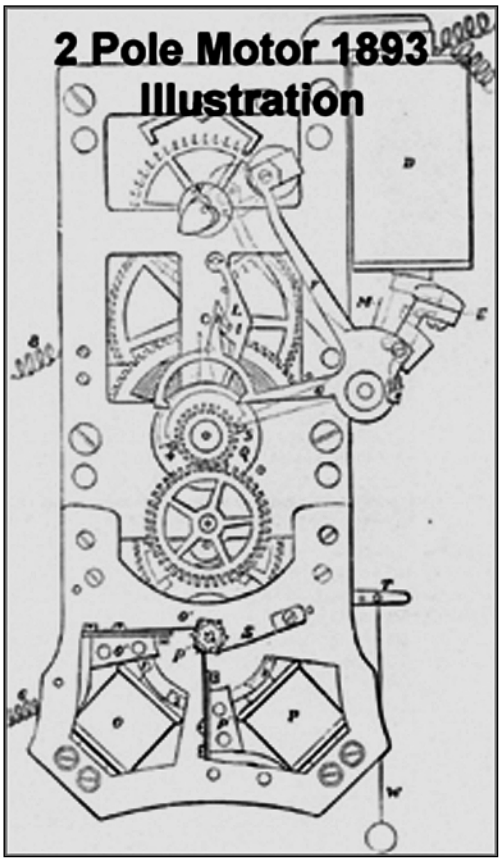


Figure 20. 1893 illustration of the 2-pole motor and movement.

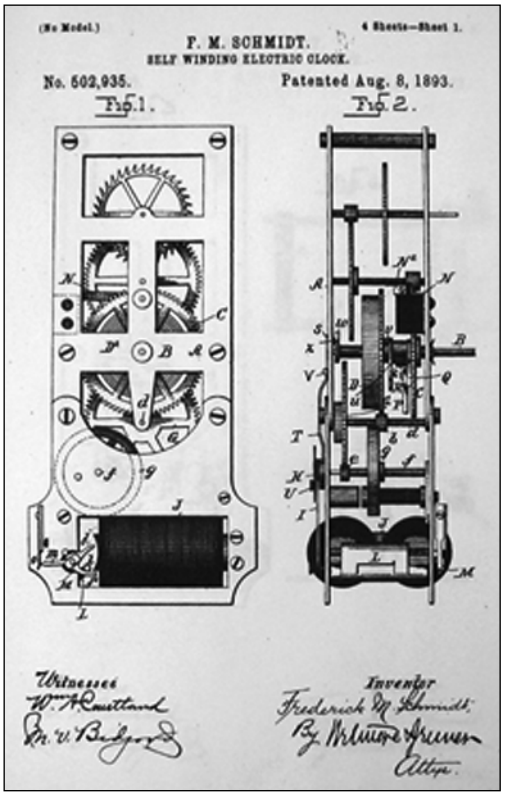


Figure 22. Patent drawing of Frederick M. Schmidt's 1893 vibrator wind Self Winding electric clock.

The other attempt proved to be eminently successful. Also in the early 1890s Frederick M. Schmidt, who later became the superintendent at SWCC, developed a winding motor that had only one magnet (one pair of coils) but started much more reliably. A major improvement was the addition of a separate spiral spring that served as an on-and-off contact as the armature vibrated up and down. The up-and-down movement turned a ratchet wheel that wound the mainspring. With the rotary wound motors the mainspring was wound directly by the rotor turning, and starting the motor could be problematic. This movement was patented in 1893 (Figure 22).[8]

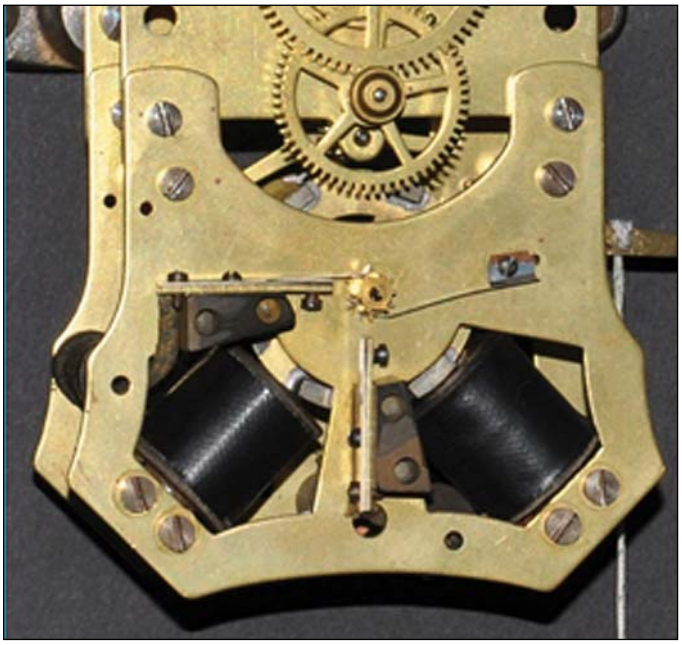


Figure 21. Two-pole motor.

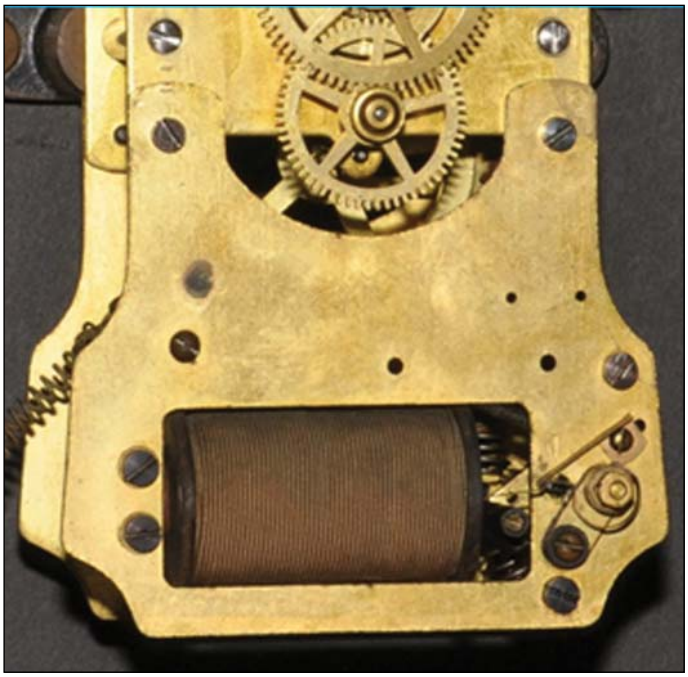


Figure 23. Style C vibrator motor.

Schmidt's vibrating motor was adapted to the style C movement and was produced as the style C vibrator movement (Figure 23). This motor also served as a replacement motor for rotary-powered movements. The motor plates did not have serial numbers, but the style C vibrator movements appear to have been the last style C movements made (type 4 plate) and have serial numbers in the 25,000 through the 27,000s. Schmidt used this reliable winding method in the style F movement he designed. The style F movement became the movement of choice for the SWCC for the next 60 years.

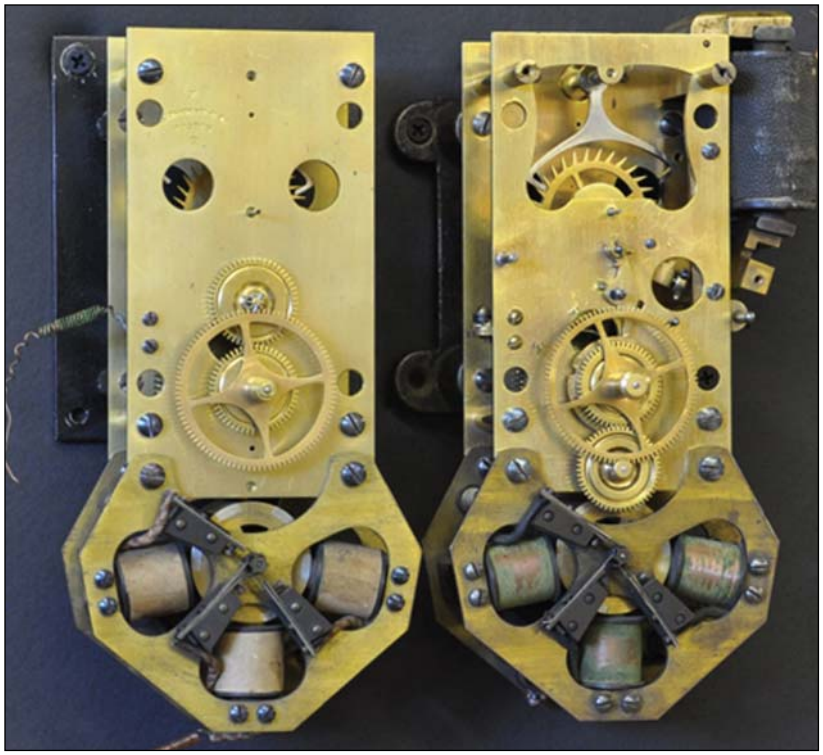
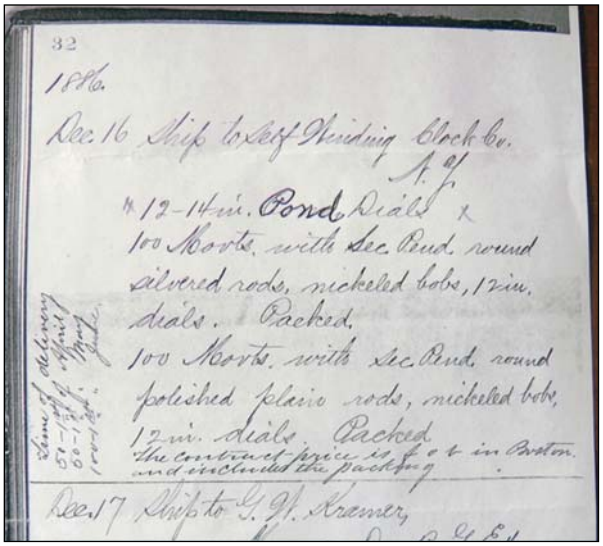


Figure 24. Style B E. Howard and SWCC movements.



32

1886.

Dec. 16 Ship to Self Winding Clock Co.

A. of

12-14 in. Pond Dials x

100 Movts. with Sec. Pend. round silvered rods, nickeled bobs, 12 in. dials. Packed.

100 Movts. with Sec. Pend. round polished plain rods, nickeled bobs, 12 in. dials. Packed.

the contract price is f.o.b. in Boston and includes the packing.

Dec. 17 Ship to G. H. Kramer,

Figure 25. E. Howard purchase order from SWCC in 1886.

Style B Rotary Movements: Earliest Marked E. HOWARD; Later Unmarked

The quality of the style B movements is clearly reminiscent of E. Howard construction. The plates and pillars are more substantial, the arbors and pinions are highly polished, and the gears and wheels are elegantly finished. The rotary motor is equally enhanced. The earliest style B movement front plates were marked "E HOWARD AND CO. BOSTON," and the later movements had no markings on the front plate and had a much larger cutout exposing the anchor and escape wheel (Figure 24). All appear to have been made by E. Howard. The style B rotary movements do not have serial numbers on the front plates but do have a number stamped on the top edge of the front plate (some movements also have that number stamped in the same place on the back plate). Without more examples it is not possible to estimate how many movements were made. The movement was available in the higher-grade clocks in the first SWCC catalog in 1887 at an additional $35 cost.

One does not see very many clocks with style B movements. E. Howard Company records reveal that as early as December 1886 SWCC was ordering movements for delivery in April, May, and June of 1887 (Figure 25). That order was for 200 movements.[9] How many additional orders were made is unknown, but it is assumed that there were not many.

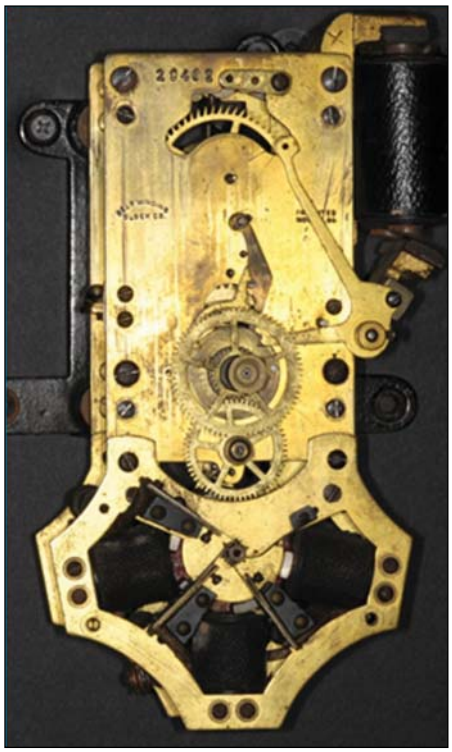


Figure 26. Style A movement.

Figure 27. Style A movement, no patent date.

Style A Rotary Movements Serial Numbers and Modifications

The solid-plate style A rotary movements were developed in the mid-1890s and were made by the SWCC. They were made at about the same time the style F was being developed. The construction of the A movement is essentially the same as the C; the only difference was the solid plates (Figure 26). The style A movements were commonly used in instances where a more precise mechanism was required. Style A movements were installed in many Western Union master clocks and were often equipped

MOVEMENT SERIAL NUMBERS OBSERVED TO DATE:

			LOW	HIGH
Style C	Type 1 front plate (#, ST, 84)	Serial numbers	82	1,275
	Type 2 front plate (#, 84, SWCC, ST)	Serial numbers	1,139	5,830
	Type 3 front plate (#, 84, SWCC, ST USA)	Serial numbers	8,069	18,878
	Type 4 front plate (#, 91, 92, SWCC)	Serial numbers	25,184	27,510
Style B	E. Howard stamped on front plate	Serial numbers	8	63
	No company on front plate	Serial numbers	174	240
Style A	Patent date (#, SWCC, 84)	Serial numbers	29,462	30,950
	No patent date (#, SWCC)	Serial numbers	32,538	32,957
Style F	Patented 1891, 1892, 1898			
	Serial numbers start at 33,000 (?)		33,228	

ROTARY MOTOR SERIAL NUMBERS OBSERVED TO DATE:

Early Rotary Motor	Serial numbers	82	1,275
Late Rotary Motor	Serial numbers	1,437	7,326

Note: many, if not most, rotary motors do not have serial numbers.

with sophisticated timing attachments and synchronizers. These movements were installed in selected installations through the 1930s.

The style A front plates have a serial number stamped on the top left. All the front plates have Self Winding Clock Co. in the middle, on the left, and some have Pat Nov 25 84 on the right.

Serial numbers for style A movements appear to start at 29,000 and run through the 32,000s.

I do not have enough serial number data to tell at what serial number the patent date stopped being included. It is presumed that because the patent date was 1884 and patent protection lasts 17 years, that about 1901 it may have been deemed unnecessary to include any patent information (Figure 27). One could assume that those movements were made after 1901. By this time no rotary motors had serial numbers, so if a motor on a style A movement has a serial number, it would be a refurbished earlier motor.

Figure 28, above. SWCC model 28. **Figure 29, above right.** SWCC manufactured dial.

Rotary Movements in Later Clocks

It is ironic when looking for patterns while trying to establish a logical manufacturing sequence to come across examples that are contrary to any sensible progression. This is the case with some clocks that clearly were manufactured when the F movement was being used on all clocks, yet these clocks are equipped with rotary movements. The only explanation is that these rotary movements were installed by the factory in clocks just to use up excess inventory (Figures 28, 29, and 30).

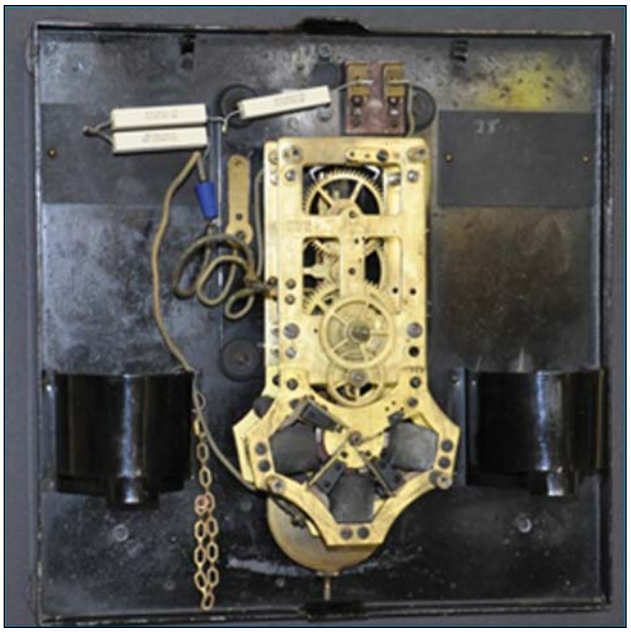


Figure 30. Rotary movement in later clock.

Synchronizers

The availability of automatic hourly synchronization was an important selling point in marketing the SWCC's very accurate time system. This discussion is about the clocks and clock mechanisms. The synchronizing hardware system is material for another article. Suffice it to say, the synchronizing hardware was available to be connected to SWCC clocks by 1886.[2] SWCC marketed their synchronized time systems to individuals and companies, and by 1889 SWCC had entered into an agreement with Western Union Telegraph Company to provide clocks with synchronizing capabilities for Western Union's time service.[10] Customers who contracted for monthly time service from Western Union were provided clocks. The clocks were manufactured and owned by SWCC and were installed and maintained by Western Union. The monthly fees were divided by SWCC and Western Union. While Western Union became SWCC's largest customer, SWCC continued to supply and service clocks and synchronized time systems for many others.

Figure 31, left. SWCC model 9.

Figure 33, above. Original movement number 1666 and replacement motor. number 3532.

Can Someone Tell If This Movement Is Original to the Clock?

Many early SWCC cases are stamped inside on the bottom, in the center behind the door, with the serial number of the original movement. On the bottom, near the corners, the model number of the clock and a plain letter C or C1 or C2 or C3 are to the left and right of the serial number. The C indicates the clock has a style C movement, and the number relates to the beat of the movement. C equals 60-beat, C1 equals 72-beat, C2 equals 80-beat, and C3 equals 84-beat movements. I also have seen 120-beat clock cases stamped C ½, indicating it is a style C movement with a ½ second pendulum. Pictured is a 60-beat SWCC number 9 regulator (Figure 31). The clock bottom is stamped with the original clock inventory serial number (1666) in the center and the model number (9) to the left and the type and beat of the movement (C) to the right (Figure 32). When the clock was originally built, the case number, the movement serial number, and the rotary motor number would have been all the same.

Figure 32. Bottom of case stamped 9 1666 C.

The movement is the original 1666 movement, but the motor is now number 3532, indicating it was replaced at some time during service (Figure 33). With this information it is safe to say the movement is original to the clock, but the rotary motor has been replaced.

The Numbers Don't Match—Which Is Correct?

If a number is stamped into the case, it will be the original inventory clock serial number and when manufactured the serial number of the movement would have been the same. In some instances a rotary movement has been replaced by a style F movement. The numbers stamped in the case will indicate what movement was originally in the clock. This model number 11 SWCC clock (Figure 34) originally was equipped with a style C rotary movement number 11531 and now has replacement style F movement number 78893 (Figure 35). In addition to the serial number 11531 there is BM stamped above the numbers. I have seen this stamped in a few clock cases but have not established what this means. I do know it does not mean B movement. This clock case is also stamped 11 for the model and 12 OHM above for synchronizer coil resistance and C1/2 for one-half second (120-beat) style C movement (Figure 36). Hence, this clock originally was equipped with style C 120-beat rotary movement number 11531 with a synchronizer. The clock does not have the original movement.

Figure 34. SWCC model 11.

Figure 35. Original rotary movement replaced with style F movement.

11 **BM** **12 OHM**
11531 **C 1/2**

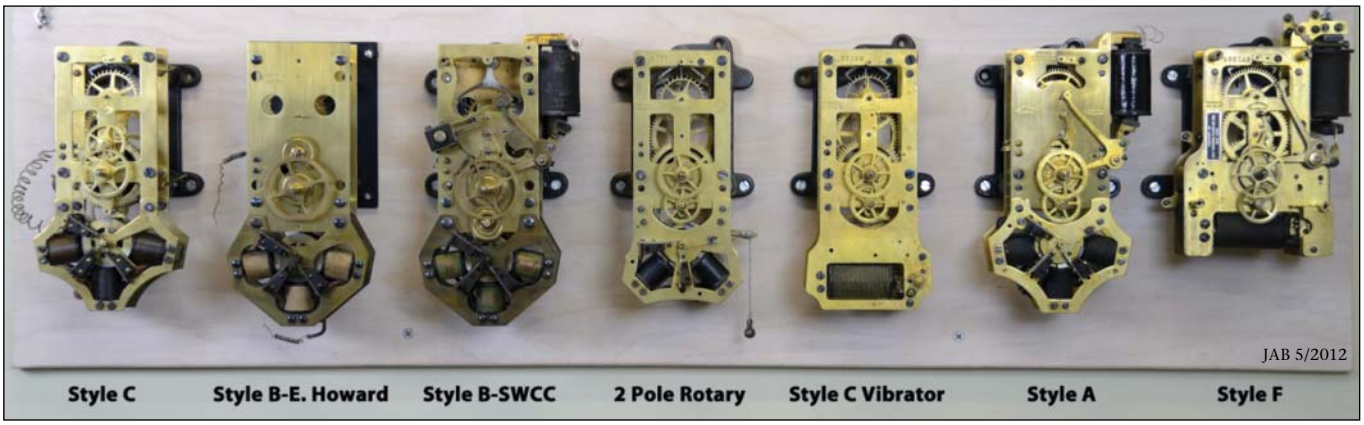
Figure 36, above. Bottom of case stamped 11, 11531 & BM, C1/2 & 12 OHM at the time of original assembly.

Figure 37, below. The evolution of SWCC movements.

A Review of the Major SWCC Movements

When evaluating the evolution of the motor wound SWCC movements there seem to be seven distinct types (Figure 37). The first movement is the style C movement with a 3-pole rotary motor. Only one style C rotary movement is pictured here but there are actually two different variations. The differences are a result of improvements to the winding mechanism and the movements all appear very much alike. Pictured next to the style C movement are the two distinct types of style B movements, both made with E. Howard components. Next is the experimental 2-pole rotary motor that is used on a third variation of style C plate movement followed by the fourth variation of the style C movement, which is powered by a developmental vibrator motor. The solid plate style A rotary movement appears next and finally the last SWCC movement design, the style F movement.

The exact dates these movements appeared are difficult to pinpoint, but we know the style C type 1 movements and the initial E. Howard style B movements were installed in the first SWCC clocks about 1886 or 1887. Style C type 2 (NOT PICTURED) with the improved 3-pole motors must have appeared by the late 1880s or early 1890s and was used through at least 1895. The larger cut out style B movement must have also been used by the early 1890s, for the winding motor has the same refinements as the improved 3-pole motor of the later style C rotary movements. By the early 1890s the style C movement with a 2-pole motor appears to have entered limited service and in 1892 or 1893 the style C vibrator movement was being installed. By 1895 SWCC had redesigned the rotary movement with solid plates and the style A movements became the last in the line of rotary motor-powered movements. Patented in 1898 and probably in service at that time was the final and long-running style F movement. A final note, these clock movements required periodic



maintenance and SWCC had a practice of exchanging the winding motor or even the entire clock movement rather than repairing them. During this exchange process any type of winding motor could have been substituted so it possible to find any combination of movement and motor. That being the case, it is uncommon to see an SWCC clock with the originally installed complete movement.

Can Clocks Be Accurately Dated?

There are no known company records to help answer this question. By understanding the sequential development of the SWCC movements, observing serial numbers stamped on the movements, and studying the often overlooked markings made to the cases, one should be able to authenticate and even approximately date these fascinating members of horological history. This article hopes to begin to establish a clearing house of data on SWCC clocks and movements. I have heard many times that this has been tried unsuccessfully before and it can't be done. I say, provide me data and we will make every effort to create a valid SWCC reference source. I am interested in all markings stamped inside the case at the bottom, serial number plates, and even service dates penciled in the case. I would like movement serial numbers and motor numbers if present. If no number is present, please indicate so. SWCC clocks with matching numbers, that is, the case number, the movement serial number, and in rotary motors, the motor numbers provide the most information. Often movements were marked with service dates; this information can be helpful. Information is also solicited on movements alone, serial numbers of movements and/or rotary motors. Even in instances where serial numbers have been removed or altered, there may still be some useful information. What I have included here is preliminary information and certainly subject to revision. The more examples I have the more reliable the conclusions can be. Please consider contributing information on your clocks and/or movements. These can help date clocks. Because F movements were so often exchanged, this data collection will be (at least at first) confined to SWCC clocks with conventional 3-pole rotary movements, the scarce 2-pole rotary movements, and C Vibrator movements.

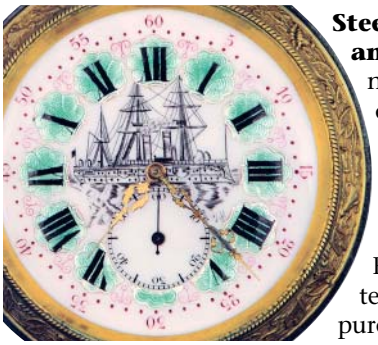
I have created a simple to use form for collectors to use to add to the database. The form can be obtained by contacting me at jabloore@aol.com.

Notes

1. C. Pond, 1884, Patent No. 308,521. Chester Pond was one of the Self Winding Clock Company founders and was also a principal in the Gamewell Fire-Alarm Telegraph Company. A skilled instrument maker and electrician, Pond was not a clockmaker, but was a very successful inventor and entrepreneur. His self-winding clock mechanism transformed electrically based timekeeping.
2. C. Pond, April 13, 1886, Patent No. 339,688.
3. American Manufacturing and Supply Company, Limited (New York: Self Winding Clocks, 1887).
4. Self Winding Clock Company, *Instructions for Installation and Maintenance of Self-Winding Synchronized Clocks* (Brooklyn, NY: SWCC, 1923): 20. The style E movement mainspring and the mainspring of the high-quality Gerry gravity escapement movements are wound with rotary motors.
5. F. Schmidt, May 19, 1891, Patent No. 452,392.
6. F. Schmidt, May 31, 1892, Patent No. 475,809.
7. *Scientific American,* Architects and Builders edition (July 29, 1893): 68
8. F. Schmidt, August 3, 1893, Patent No. 502,935.
9. NAWCC E. Howard records, December 1886.
10. Bartky, I. R., *Selling the True Time* (Stanford, CA: Stanford University Press, 2000): 273

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. He also has numerous Self Winding clocks that are synchronized hourly by a Self Winding masterclock. He has been compiling a list of SWCC movement serial numbers in an attempt to approximately date the time of movement manufacture. In some instances this can help to date individual clocks and establish originality. He previously authored the "School Clock Systems of The Standard Electric Time Company" and the "Bad Robot Clock System: Mid- Century Clock System in a High Tech Setting," published in the *Watch and Clock Bulletin* in April 2011 and October 2011. An article titled " The Self Winding Clock Company and the Ubiquitious Style "F" Movement" was published in the *Watch and Clock Bulletin* May/June 2012 issue. 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.



Steel Time, a remarkable display of 200 gunmetal watches, is at the National Watch and Clock Museum now through December 11. Made between 1850 and 1910 of burnished steel, each watch in this exhibit is unique, with variations in movement complications, case ornamentation, and brilliantly original dials.

Knowledgeable collector François-Paul Journe accumulated this collection for many years. It was previously on exhibit at The Forbes Galleries in New York, the salon of F.P. Journe's Manufacture in Geneva, Switzerland, and at the Embassy of Switzerland in Tokyo, Japan.

F.P. Journe has published a 300-page book about the watches in his collection, *Steel Time*, written by Jean Claude Sabrier and Georges Rigot. During this exhibit *Steel Time* will be available for purchase in the Museum Store.