Draft

Evolution Of The First Successful Industrialized Watch

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The use of automated machinery turning out interchangeable parts on a large scale in the making of watches was first achieved in America in 1850 by the Boston Watch Company located in Roxbury, Massachusetts. Although not the first people to employ the use of machines in making watches, through *Yankee Ingenuity,* Aaron L. Dennison, Edward Howard, David P. Davis and Samuel Curtis were the first to put it all together and to start a major watch enterprise. Unfortunately, like those who preceded them, their initial efforts were not financially successful. However, they did lay the important groundwork. Not to slight Howard who did continue on and built his own successful company, Royal Robbins came on the scene and salvaged the failed company with a bankroll. By applying his marketing genius, Mr. Robbins turned the fledgling company, now in Waltham, Mass., into a world class manufacturing company. His first product line, the Model 57 pocket watch (later named for the year of its introduction), led the way to the success of the American Watch Company.

The author's forthcoming 200-page monograph, "Origins of the Waltham Model 57", chronicles this first successful industrialized watch, starting in 1850 and through the following 30 years by the American Watch Company. Much of the material and references for this presentation came from the monograph.

Based on compiled data from surviving watches and on researched documents, the Boston Watch Company made and sold approximately 5,000 movements and 4,000 cases before it failed financially. In addition it had another 1,300 watches in various stages of production in the factory at the time of its failure. The company was not falling apart in the spring of 1857, they just ran out of money and places to get it. Reportedly the company had invested $150,000 and owed $174,000 when they went insolvent on April 15, 1857 (bankruptcy was called insolvency in 1857). After loosing a personal fortune, Mr. Curtis was essentially the sole owner of the company at this time. In his insolvency affidavit he was upbeat and believed he could pull it off. See references [r1], [r2 page 56] and [r3].

Maybe in better financial times and with a little more luck, Mr. Curtis might have been able to turn the company around financially. However, the author's contention is that it never would have been as successful as the American Watch Company without the aggressive marketing strategy injected by Mr. Robbins. Even if the company had found Mr. Robbins before the insolvency, the founders would unlikely have accepted him in control; and Mr. Robbins would unlikely have invested in the company with such a large debt. Indeed, Royal Robbins got a good deal when buying the watch factory at the insolvency auction, even if he did not fully appreciate it at the time.

After abandoning an attempt to manufacture 8-day watches, the 30-hour watches produced by the Boston Watch Company (Warren, followed by the Samuel Curtis, and followed by the Dennison, Howard & Davis) are very similar to the so-called Model 57, and although many people would disagree, the author considers them to be in the family line (at least the Dennison, Howard & Davis). There are fewer differences between the Dennison, Howard & Davis and the first Model 57 than there are between early and late M57s. Many collectors consider them to be as reliable and as good of a timekeeper as the M57.

The Dennison, Howard & Davis Watch

Desiring to leave the extremely dusty conditions at the Roxbury factory, and planning for future expansion where employees could have comfortable homes, the company built a modern factory on the Charles River in Waltham, Massachusetts in the fall of 1854, on lands of the Waltham Improvement Company [r4 page 740].

All of the watches produced at Waltham by the Boston Watch Co. (BWCo) were engraved Dennison, Howard & Davis (DH&D), except perhaps 100 movements marked Fellows & Schell, in the name of the watch wholesalers who helped finance the new operation (as reported in the literature, although no such Fellows & Schell examples yet have surfaced publicly). The DH&D serial numbers range from 1001 to 5000 (#5000 is a new design).

The train was geared for 16,200 beats per hour (4.5 per second) on the DH&D, faster than the slow English train of 14,400 beats per hour (4 per second), but still slower than 18,000 beats per hour (5 per second) which became the standard later. The Model 57, though, was still geared for 16,200 beats per hour.

The train arrangement on the first several hundred DH&D movements is different from both the Samuel Curtis and standard Model 57; i.e., its 4th, 3rd, and center wheels are stacked above one and another, and the center wheel, which is solid, is buried in the pillar plate (see Figure 3 on page 3). This observation is consistent with E.A. Marsh's statement in his history of the watch company that the first "few hundred movements had been started in the Roxbury plant" [r5 page 15]. Author refers to this transitional layout as the *Roxbury Train*.

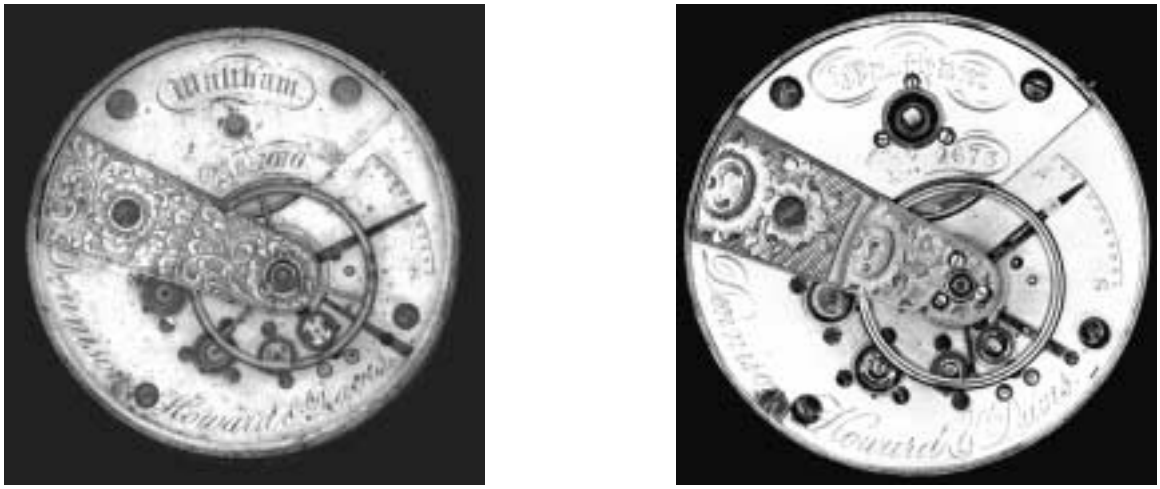


FIGURE 1. DH&D Nos. 1016 and 2673

As explained above, author believes the early movement on left in above figure (S/N 1016) might have actually been made at the Roxbury plant and not at Waltham. Note the addition of key guard cup around the winding square on later movement (S/N 2673). The steel guard cup was applied to the DH&D top plate some time between serial numbers 1540 and 1718. See table on page 4 (Introduction of DH&D Design Changes).

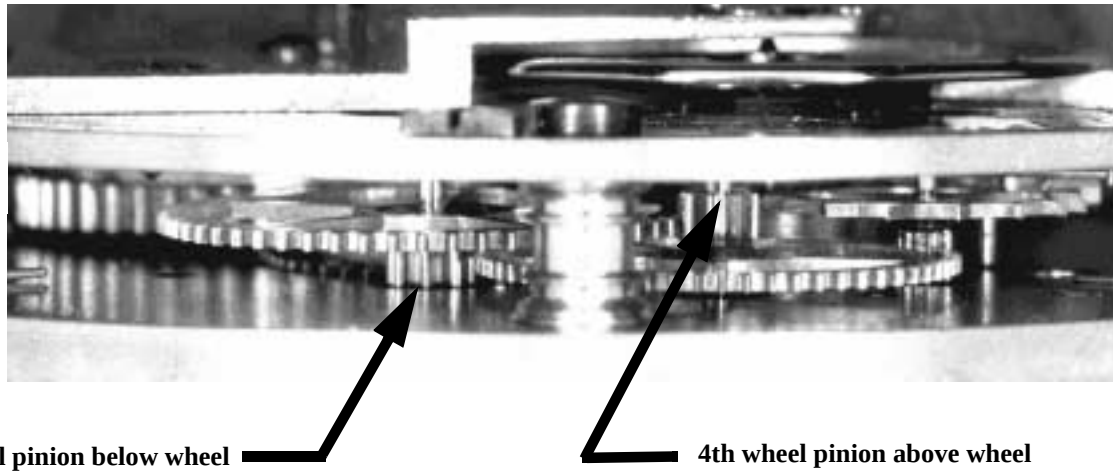
Plate jewels were begun to be made at the factory. They were similar in appearance to the early imported aquamarine jewels (basically colorless to pale blue-green); they were made from beryl and chrysoberyl [r6].

Several feature changes in addition to the train were introduced during the production lifetime of DH&D movements including wind guard (mentioned above), "peep holes", and potance. The "peep holes" shown below in the DH&D 3730 pillar plate allow the escapement to be seen in motion.

DH&D 1016 **DH&D 3730**

FIGURE 2. Progression Of Pillar Plates On The DH&D

DH&D 4546 (standard M57)



DH&D 1016 (Roxbury train)

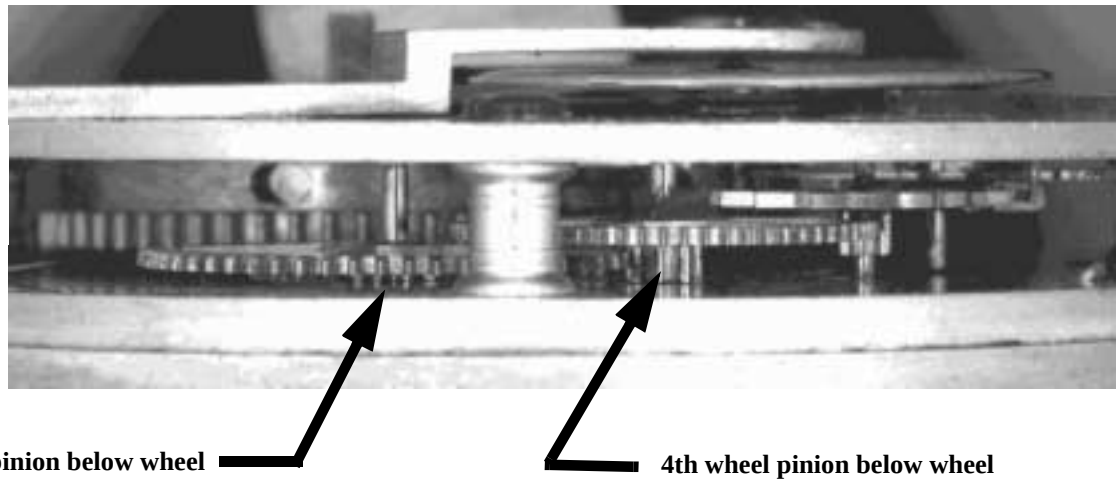
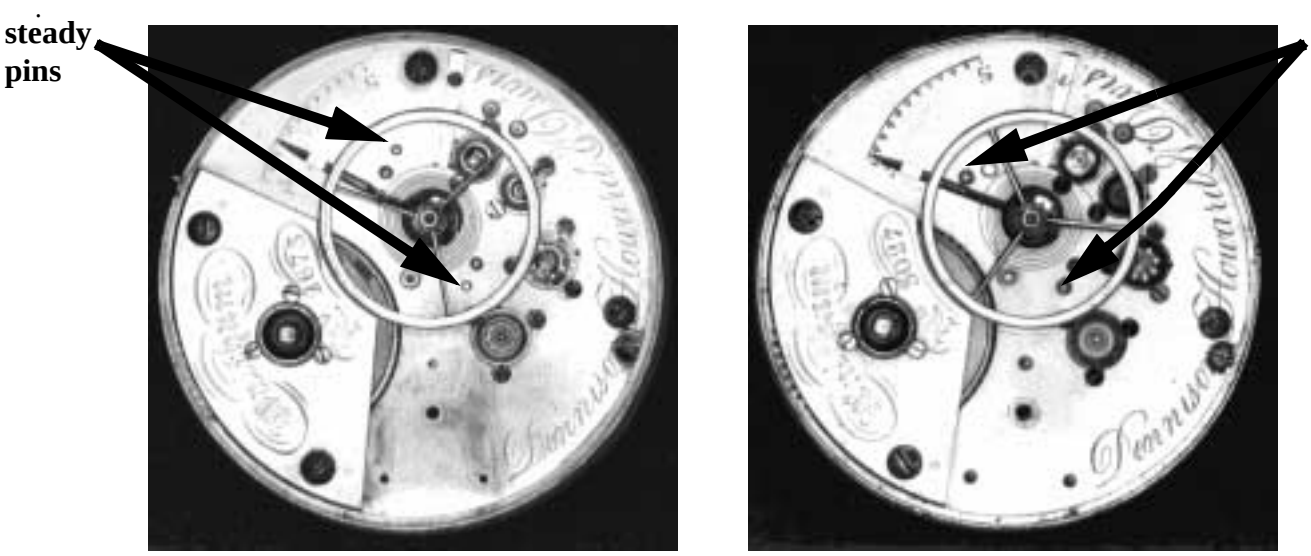


FIGURE 3. Different Train Arrangements Between Early and Late Dennison Howard & Davis Movements

The method of attaching DH&D potances changed from earlier versions to later ones. The potance, 'U-Bridge' shape (some people call it the butterfly potance), is attached by a screw in the center of each foot of the potance. The potance also has a steady pin on each foot which protrudes through the top plate along with the screw hole as can be seen in Figure 4 on page 4. The original old fastening method has the steady pins on opposite corners whereas the new style has the steady pins on the same edge.

Although no 16 jewel DH&D movement yet is known to author, it is strange the first movements produced by the following companies, Howard's and Robbins', had 16Js, where the center arbor on the pillar plate is jeweled. This jewel is hard to see and is often missed. Perhaps someday a later numbered DH&D will surface with 16Js. There is evidence that movements in the last 100 group (4901-5000) were cannibalized for new company movements, but some may have survived.

The table on next page documents when design changes were made to the DH&D by serial number according to data collect by author.



Old Method on S/N 2673 New Method on S/N 3027

FIGURE 4. Old and New Fastening Arrangements of DH&D Potances

TABLE 1. Introduction of DH&D Design Changes

S/No.	Train	Wind Grd.	Peep Hls.	Potance	16J
1016	Roxbury	None	No	Old	N
1136	Roxbury	None	No	Old	N
1483	Roxbury	None	No	Old	N
1517	M57	None	No	Old	N
1540		None		Old	
1547	M57				N
1718		Yes		Old	
1724	M57	Yes	No	Old	N
2299	M57	Yes	No	Old	N
2471	M57	Yes		Old	N
2673	M57	Yes	Yes	Old	N
2776				Old	N
2886		Yes		Old	
2929		Yes		New	N
2938		Yes		New	N
2954		Yes		New	N
3020		Yes		New	N
3027	M57	Yes	Yes	New	N
3730	M57	Yes	Yes	New	N
4546	M57	Yes	Yes	New	N
4915		Yes			?
S/No.	**Train**	**Wind Grd.**	**Peep Hls.**	**Potance**	**16J**

The Bankruptcy (Insolvency)

With his partners, Tracy & Baker Co., Royal Robbins bought the factory of the insolvent The Boston Watch Company at auction on Saturday, May 9, 1857, from assignee Nathan W.C. Jameson [r7]. According to Robbins' records he paid a total of $41,500 (real estate and contents separately) plus two mortgages amounting to $14,380 in liabilities [r8 pages 28, 38, & 314] (interestingly the assignee's court record is $4,000 less [r3 Sheet 139]).

It is speculative history as to how much inventory Robbins found in the factory when he took over, but he did not take much time to get the factory operational again. He produced his first 100 watches in July of 1857. The Serial Number Ledger [r1] lists 1,360 movements being finished from July through December 1857; 730 in November and December for an average production of 365 movements per month by the end of year. A March 13, 1856, Waltham Sentinel news article puts the production around 250 to 300 movements per month a year prior to the company going insolvent [r9 page 144].

For the first couple of months, Robbins named his new company Tracy Baker & Co. Then Baker sold his interest to Robbins on June 30, 1857, and James W. Appleton was brought on for his influential contacts [r10 pages 690-2]. Tracy left to attend to his watch case business, but Tracy's name was kept in the title of the company, though, Appleton Tracy & Company (AT&Co).

The AT&Co name was adopted September 1, 1857, according to Marsh [r5 page 23], but this might have been an official date because the name change was reported on July 17, 1857, in the Waltham Sentinel newspaper. Movements were engraved AT&Co starting in July 1857, and including a few TB&Co, per the Serial Number Ledger [r1].

The Appleton Tracy & Co Watch

Robbins' first watches were finished in the style of the Boston Watch Company watches but engraved with the trademark Appleton Tracy & Co. (AT&Co) [r1]; actually, the first few movements were engraved Tracy Baker & Co (at least twenty movements, 5001-5020, per sales records). Indeed, the Tracy Baker & Co. movement S/N 5012 has markings identical to DH&D movements [r11 page 48]. However, Robbins quickly introduced his own style. Engravings on AT&Co serial number 5341 shown below have the new AT&Co appearance, but the potance is the same as employed on DH&D movements and the full four-digit serial number is stamped on the underside of the top plate as on DH&D movements, neither of which is the case on later movements.

FIGURE 5. Early AT&Co Model 57 Movement 5341

According to the Serial Number Ledger [r1], the first AT&Co movements were given numbers 5001 to 6500 (including the few TB&Co), numbers 6501 to 6590 are nameless/private label (but probably AT&Co grade), and 6901 to 8100 were not made. The AT&Co numbers then jump to 15,501, January, 1859. Serial number 5001 is a continuation of the BWCo numbers at which their finished production units ended just below or at about the coincidental even number 5000.

The AT&Co signature was retained as the quality grade for the full duration of the Model 57 product line which stayed into production through 1878. Vernon Hawkins' production report lists 62,165 AT&Co grade Model 57 movements were made [r14 page 4].

The C.T. Parker and P.S. Bartlett Watches

Almost immediately Robbins began plying the "supply and demand curve". He introduced a lower grade 7J C. T. Parker in November, 1857, and the P. S. Bartlett in December. He also introduced a version of the Bartlett the following January with 11 jewels (top plate jeweled only) probably to give it the appearance of a 15J watch. These watches were offered at much lower prices than the AT&Co grade, presumably to increase sales to compensate for the lower margins. This run of Parker watches have serial numbers 1001 to 1400; the Bartlett watches have serial numbers 1401 to 2200 [r1]. Although the BWCo offered some lower cost 7J DH&D movements, Robbins' lower grade watches were very distinctive.

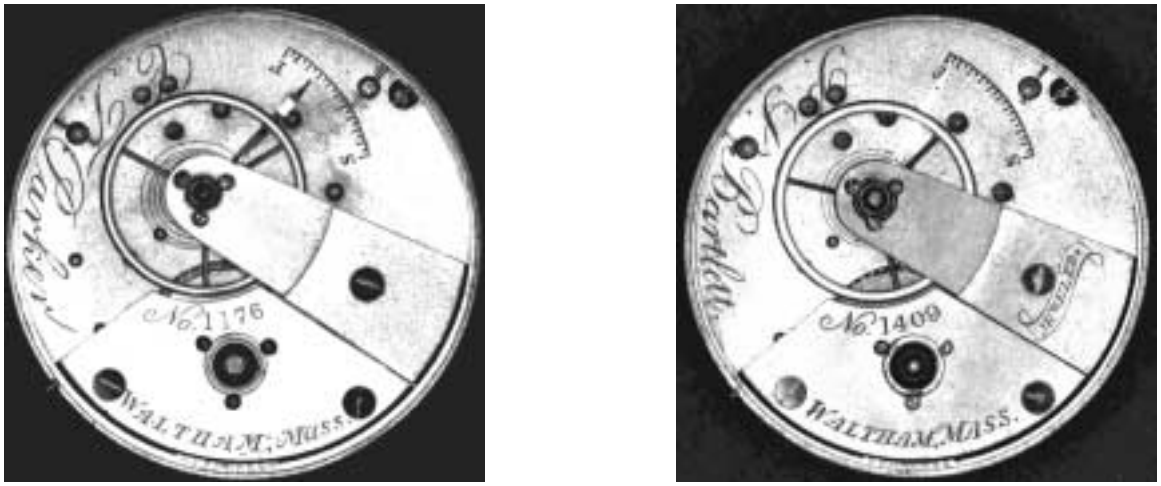


FIGURE 6. First Run C.T. Parker (S/N 1176) & P.S. Bartlett (S/N 1409), Forerunners of AWCo's Commodity Products

These first-run less expensive models have their top plate pinned to pillar posts as can be seen above instead of being secured with screws; this saved labor and costs as screw manufacturing had not yet become highly refined. On the other hand, the pinned plates might have been an intentional distinguishing feature as these watches employed many other screws. The hairspring is also anchored in a brass stud on the plate under the balance cock on these watches, presumably hidden like this so the stud could be left unfinished and be less costly to produce. Although the C.T. Parker and P.S. Bartlett movements did not employ the same potance on the AT&Co grade, they did share the same design of ratchet, ratchet bridge, click, and click spring. These differences alone do not seem to justify the price difference (movements: ~$24 AT&Co, ~$16 Parker and ~$12 Bartlett; per [r13 pages 4-9 & 33-38]); indeed, there does not seem to be any difference at all between the Parker & Bartlett.

Mike Harrold points out that Robbins used the AT&Co movement as the quality grade leader and the Parker/Bartlett movements as the common consumer watch. This successful merchandising technique launched the success of the American Watch Company into a world-class manufacturing enterprise. Sales of the P.S. Bartlett Model 57 watches far exceeded the AT&Co grade watch [r12 page 589]. Hawkins estimates nearly 293,000 P.S. Bartlett Model 57 movements were made, 35% of the total Model 57 production [r14 page 4].

An unexplained mystery is why Robbins used serial numbers starting with 5001for the AT&Co movements and then dropped back to 1001 - 2200 for the C.T. Parker and P.S. Bartlett movements. These lower numbers are duplicates of the numbers on the DH&D watches produced at the Waltham plant by the Boston Watch Company. Harrold suggests the juggled numbers was a subterfuge to allow disavowing the lower grade movements as old BWCo material in the event they were not well received [r12 page 589].

A second run of C. T. Parker watches, signed Chas T. Parker, was produced in 1858. They have serial numbers 8101 to 8300. The second run of P. S. Bartlett watches have serial numbers 8301 to 13700 (except 11961 to 12000 may have some Bartlett & Parker inscriptions, and a few private label movements according to reference [r1]).

Based on observation, these second run watches were a continuation of the lower grade watch designed to be more affordable, including pinned plates and the hidden hairspring stud, although the Parker appears to be a better grade than the Bartlett. Vernon Hawkins lists the second run Parkers as having mostly 15 jewels (reference [r1] does not give the jewel count for these) whereas the Bartletts have 7 and 11 jewels [r13 pages 54-57]. The Parker was probably upgraded to justify its price.

Pinned plates were continued on the Bartlett until late 1858 (around S/N 12,500) according to author's compiled data table. Also many Bartletts were fitted with 15 jewels, especially in later runs, but the 15J P.S. Bartlett was discontinued by end 1860, favoring the 11J instead for this grade [r1]. These later run 15/11J movements were also made to look higher grade by engraving fake jewel settings into the top plate; the jewels in earlier versions were burnished into the plate.

FIGURE 7. 15J Chas T. Parker 8153 with real jewel settings and 11J P.S. Bartlett 8406 with burnished jewels

Photo of P.S. Bartlett 8406 permission of Hans Dahlke.

American Watch Company

The depression of 1857 hit the company hard [r8 page 29]. Watches were sold at auctions [r5 page 23], and dumped at twice discount [r8 pages 32,36,&268] to get cash. Robbins was also able to arrange loans from Boston capitalist through his contacts, and employees were asked to work at half salary [r10 page 700]. By autumn 1858 the financial clouds began to break and a market for watches gradually re-emerged [r4 page 741].

On August 26, 1858, the Waltham Improvement Company agreed to merge with AT&Co [r5 page 23], and reorganized as the American Watch Company (AWCo) on January 1, 1859 [r8 pages 316-318]. Robbins signed over the land and buildings to the Improvement Company a little earlier on August 13, 1858, for the same price and outstanding mortgages when he purchased it [Registry of Deeds, Middlesex County, Book 799, page 15].

Production under the new name started with serial numbers approximately 15000 per [r1]. The AT&Co name was retained as a trademark of excellence [r5 page 24]. Approximately 200 employees produced 50 watches/day in 1859 (compared to 2,000 employees producing 1,200 watches/day in 1883) [r8 page 56]. This production rate was now competitive with foreign manufacturers, and better.

The Chronodrometer Watch

The so-called Sporting Watches (chronodrometer stop watch) followed the second run P.S. Bartlett in serial number (13701); see [r1]. The stop watch complication of the chronodrometer was built on the Model 57 design. A wire lever through the plate (at 8:30 in picture on next page) stops and holds the balance wheel when the stop button is pushed. It was not very successful because as pointed out by Hauptman, "The watch, while ingenious in its simplicity, compared to foreign stop watches, is highly impractical" [r10 page 697]. On the other hand, the culture in America in 1858 - 1860s probably had more to do with its lack of success.

According to the Serial Number Ledger [r1], material might have been allocated for the stop watch chronodrometer in 1858-1859, but production stretched out through 1865 when leisure time was more available for the sporting gent.

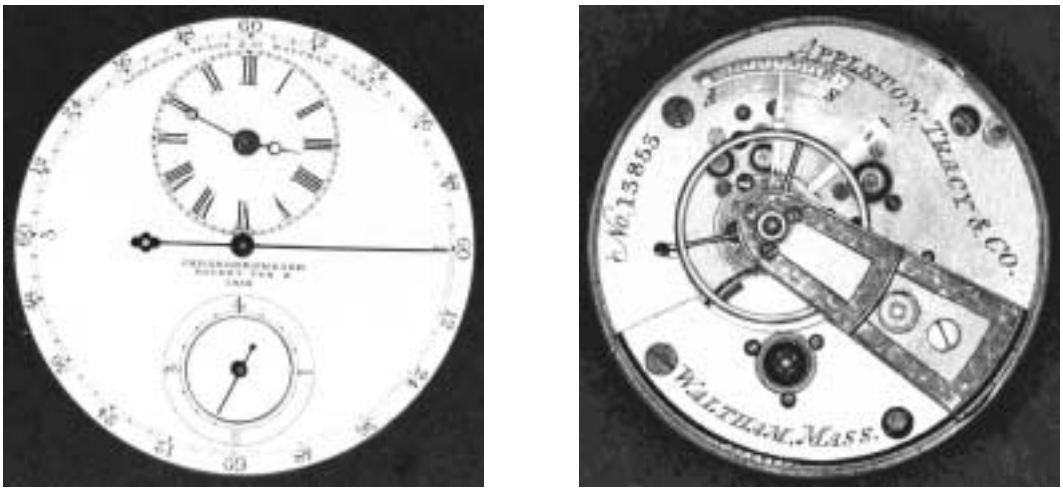


FIGURE 8. Sporting Chronodrometer No. 13853

The J. Watson and R.E. Robbins Watches

By November, 1859, the company introduced its first new model, the thinner 3/4 plate Model 1859 KW18 [r1], perhaps to compete with the upcoming Nashua Watch Company. However, Robbins still kept experimenting with the Model 57 in varying grades.

Based on appearance and the Serial Number Ledger [r1], the Chas T. Parker grade was followed by J. Watson and R.E. Robbins grades. First run J. Watson watches have a unique engraving with the name “London” on the barrel bridge and had an English appearance (at least some did). With this designation they might have been made for export; on the other hand, more likely, they were another Robbins’ experiment and were made to look like an English import. The second run all appear to be engraved “Boston” per author’s compiled data.

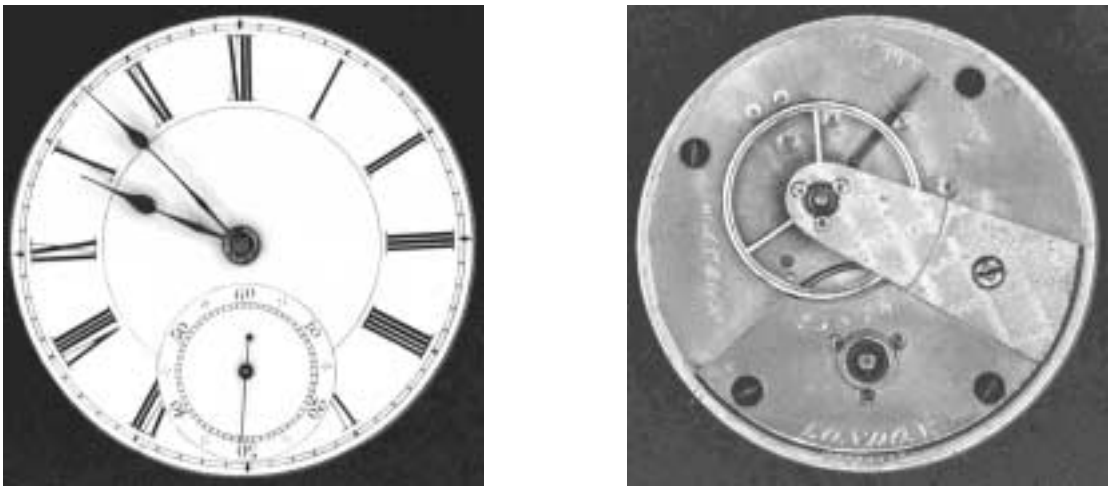


FIGURE 9. J. Watson S/N 23878, London, With English Appearance

According to the Serial Number Ledger [r1], the first run J. Watson movements (all 7J), S/Ns 23601-24500, were made September 1859 through October 1860; the second run, S/Ns 28201-28700, were made November 1860 through April 1861, including 11J versions. R.E. Robbins movements (all 11J) were produced with S/Ns 25101-25300 in September through November, 1859; and with S/Ns 26801-27400 in November 1860 through March 1861. The R.E. Robbins movements appear identical to the P.S. Bartlett being produced at the time. It is unclear why so few, or why any at all, were produced (there is a story here yet to be heard). See picture of a R.E. Robbins on next page.

The William Ellery Watch

Aaron Dennison, co-founder of the Boston Watch Company, was discharged from the company in 1862 for being a vocal dissenter on the staff. Moore reports that Dennison was advocating the making of a cheaper watch to sell to the Civil War trade, and this is what got him in trouble with the company [r8 pages 45-46]. By this time the company's next marketing experiment, the William Ellery grade M57 watch, became the popular Civil War *soldier's watch*, which vindicated Dennison's judgement; Moore reports that, "By 1865 the soldier's watch - the *Ellery* - accounted for 44.6 per cent of unit sales and 30.4 per cent of the dollar volume." [r8 pages 47-49] Hawkins estimates nearly 212,000 Wm. Ellery Model 57 movements were made, a quarter of the total Model 57 production (second to the P.S. Bartlett, but starting 4 years later) [r14 page 4].

Dennison chose the Wm Ellery name as being distinctive and one of the signers of the Declaration of Independence from Rhode Island [r5 page 27]. However, because of the war market, this watch probably would have sold well under any name.

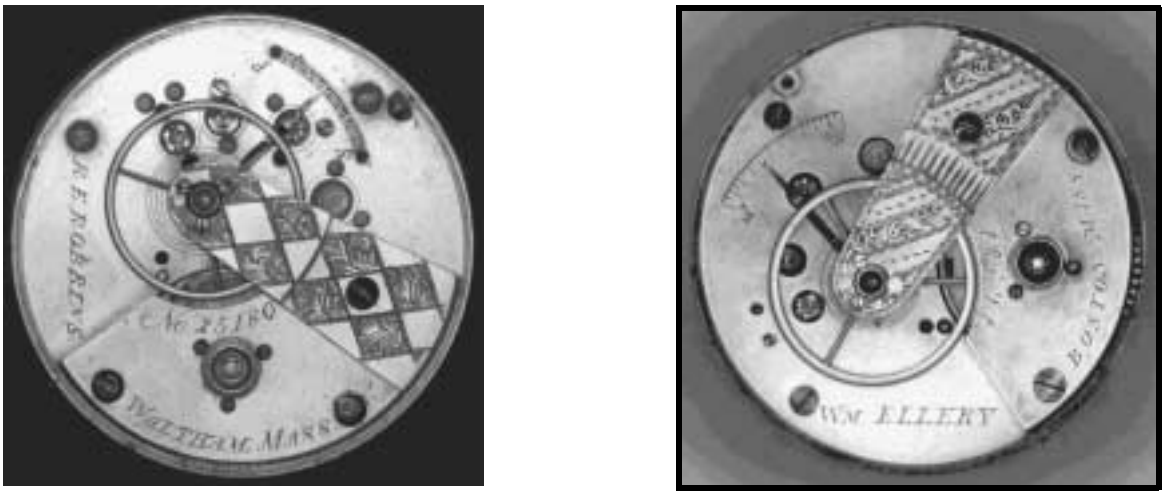


FIGURE 10. R.E. Robbins 25180, and Wm. Ellery 46211 permission of Charles Wallace

The Serial Number Ledger [r1] lists the Wm. Ellery being introduced in May/Aug 1861, 42501-800; the next run was January 1862, 42911 - 43100; followed in February 1862 by 46201 (author has yet to see any evidence of an Ellery M57 below 46200). The barrel bridge on the earlier runs were engraved "Boston", perhaps to distinguish them from the P.S. Bartlett grade. They were offered in both 7J & 11J versions (author has yet to see evidence of a 15J Ellery).

11J Boston 72448 **7J Waltham 641366**

FIGURE 11. Example Wm. Ellery Model 57 Movements

The Home Watch Co. Watch

The next low end Model 57, the Home Watch Co. (HWCo) grade, was introduced in December 1866 with serial number 283001 with 7Js (the following January 11J versions were also offered) according to Serial Number Ledger [r1], probably to compete with the newly founded National Watch Company. The barrel bridge was engraved Boston instead of Waltham possibly as camouflage to convey the impression that this low grade watch was not made by the AWCo. The William Ellery M57 was already engraved Boston, and at this time was changed to Waltham per author's data tables. These watches were characterized by under sprung steel balance, engraved index and no key guard protecting the winding square. Hawkins estimates 131,000 HWCo grade Model 57 movements were made, 16% of the total Model 57 production (very successful considering this grade started December 1866) [r14 page 4]. Author has data of 7J Home movements selling for $8 in 1867.

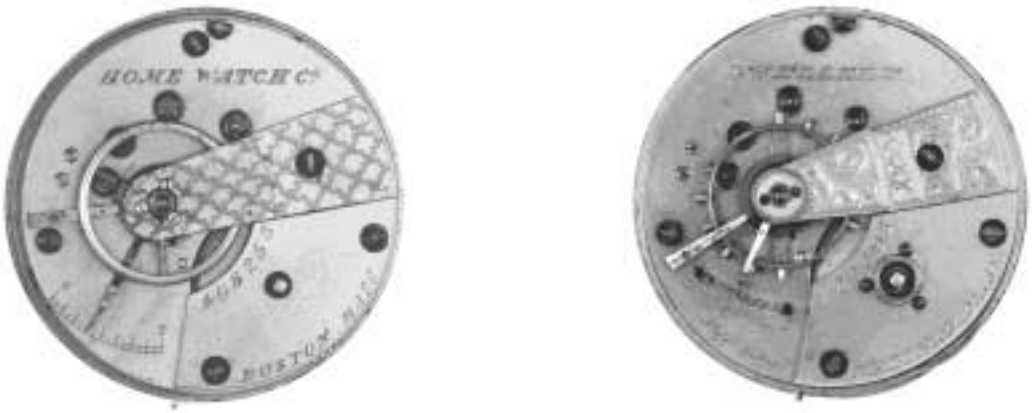


FIGURE 12. 11J Home Watch Co. 468253 and 11J Wm. Ellery 711193

About the time the HWCo grade was introduced, the Wm. Ellery grade was upgraded with a sprung over balance and an applied index strip. They also were offered with a closed (uncut) bimetallic composition balance to give the appearance of the higher grade expansion balances used then on Bartletts.

The Waltham Watch Co. Watch

The Waltham Watch Co. (WWCo) grade was introduced in 1867 apparently as a bridge between the high grade AT&Co and low grade HWCo movements. However, material might have been reserved for this grade as early as 1862. According to the Serial Number Ledger [r1] a single WWCo movement S/N 58115 was made March 1865; S/Ns 58216-58220 and 58222-58290 were made January 1867 (other grades of watches in this serial number range were made in 1862 to 1863); the next batch S/Ns 295001-296000 were made March to May 1867. Total number made was about 60,000 per Hawkins [r14 page 4].

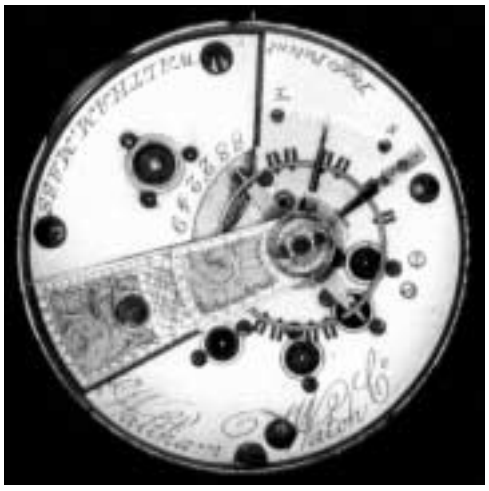


FIGURE 13. Waltham Watch Co Grade M57 882249

According to author's compiled data tables, all WWCo movements were given 15 jewels, but not quite all of the features of the AT&Co grade (e.g., the jewel settings are fake, just engraved in the plate). It was provided with a stem wind even before the AT&Co grade, albeit not a very good one (probably because at the time the company was offering stem winds in higher grade models).

Upgrading the Grades

As Robbins introduced new Model 57 grades, he continually upgraded the existing grades with added features (as mentioned above with the Wm. Ellery). The AT&Co Model 57 in below picture was delivered in 1869 several years after the AWCo offered its better grade 3/4 plate models. Although no longer the company's top offering, the AT&Co grade was the best in the Model 57 line. It was spruced up to look more like the 3/4 plates, but was offered at a more affordable price. Robbins was covering all bases. Note the plate jewels are smaller than on the earlier version and their settings are secured with two screws like the 3/4 plates versus three on earlier versions. Perhaps more important, the regulator and index were moved to the balance cock like on the 3/4 plates. This was done only on the AT&Co grade Model 57 (not even the WWCo grade). Also note that the serial number is engraved on the plate on the AT&Co, whereas it is on the barrel bridge on all other Model 57 grades.

FIGURE 14. 15J AT&Co 365660 and 11J PSB 406849

The P.S. Bartlett (PSB) grade became Robbins' mainstay Model 57, the middle ground grade, and was produced throughout the entire life cycle of the Model 57. As can be seen on the above 11J example made in 1869, it is fitted with an expansion balance like the two higher AT&Co and WWCo grades. Although there are exceptions (perhaps not original), the two lower Ellery and HWCo grades were not given expansion balances. Like the WWCo grade, the balance is sprung over and the jewel settings are fake on the PSB. By 1869, with the 3/4 plate models for people with money and these five varying grades of M57s (AT&Co, WWCo, PSB, Ellery and HWCo), Robbins was making a watch to fit every taste and pocket book!

Crescent Park and Martyn Square Watches

Introduced in May, 1875, the Crescent Park and Martyn Square grades appear to have been made for export (at least the only Crescent Park the author has seen and several Martyn Squares surfaced in England - another successful Robbins experiment). Their style of engravings, balance cock (with hairspring stud and wider base), and curved barrel bridge look like a cross with the Model 70 perhaps to be more acceptable to the English market. The balance cock and barrel bridge on these export Model 57 watches are not listed in the "Waltham" 1885 Materials catalog. Perhaps these grades should not be called Model 57s, but they share most of the same parts, including the 4-pillar plates.

A good number of Martyn Squares were made, mostly 7J and 2-pair 11J (about 16,000 per Hawkins [r14 page 4]). The Serial Number Ledger [r1] lists Crescent Park as all 15J, S/Ns: 816801-890 (May - June, 1875), 816901-930 and 816941-960. See pictures on next page.

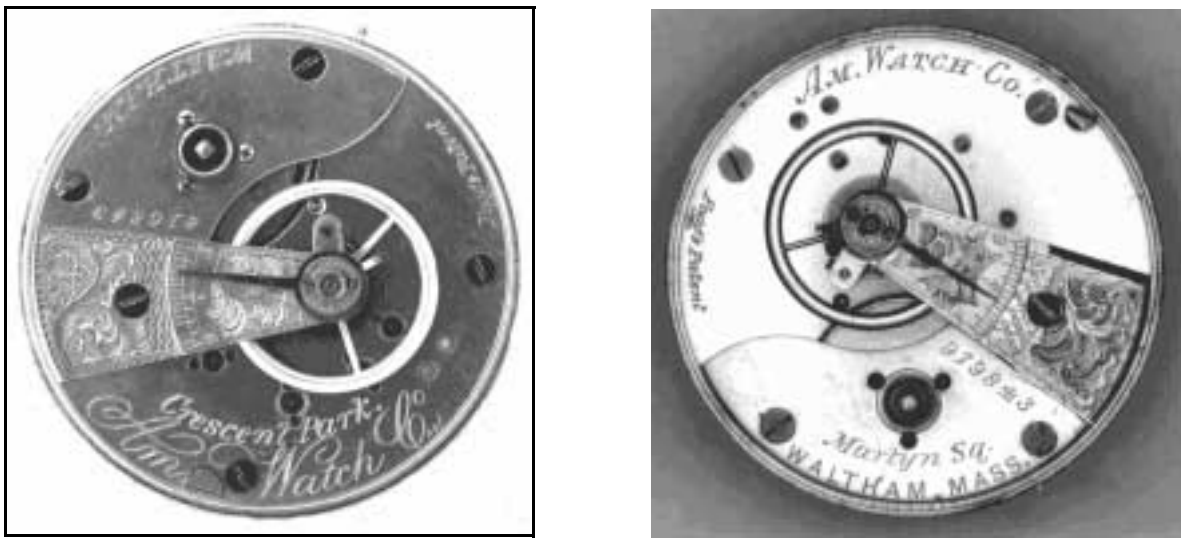


FIGURE 15. 15J Crescent Park and 7J Martyn Square Movements (both with gold balances)

Note the S-shaped barrel bridge and studded hairspring. Also the plate jewels are smaller than on the standard Model 57.

Central Park Watch

The Serial Number Ledger [r1] lists Central Park S/Ns 842801-842875 (September to December 1875) as nickel movements.

The Broadway Watch

The Broadway Model 57 grade was introduced in 1876 starting with S/Ns 596901 - 597000, and only in 7J KWKS versions, according to the Serial Number Ledger [r1]. Author has not yet seen evidence of any 11J Broadway nor stem wind, including in [r1]. Robbins might have reserved material for this grade much earlier because these beginning serial numbers are in the range of movements made in 1872 for other grades. Perhaps he was waiting for the right time to introduce his next low grade.

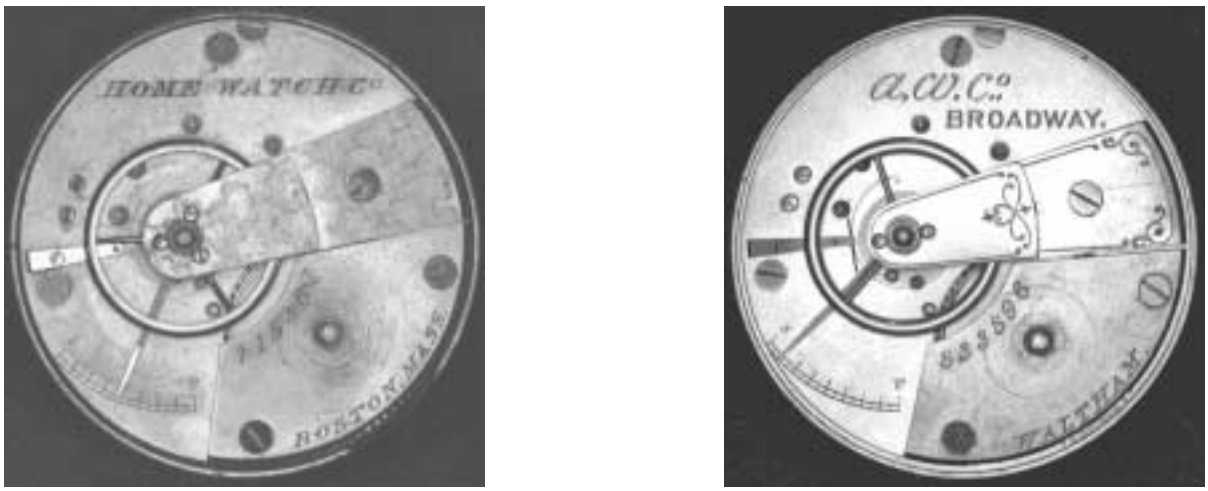


FIGURE 16. Example HWCo and Broadway grade Model 57 7J Movements

Note in the pictures the absence of the key guard cup protecting the winding square. From observation, only the Broadway and HWCo Model 57 watches did not have key guards (author has seen only one Broadway exception to-date).

The Broadway was probably Robbins' response to the cheap unjeweled watches beginning to appear on the market at the time. Except for their predominantly nickel balances, the Broadway does not appear to be any "cheaper" than a 7J KWKS HWCo; however, this grade bore the distinctive A.W.Co. Waltham signature probably because by then the HWCo was selling well. From observation, when the Broadway was introduced, the HWCo grade was upgraded with Fogg's safety center pinion (see "Safety Center Pinion" on page 17); the Broadway was never given this feature.

The Broadway was very popular. Although late in the Model 57 life cycle, according to Hawkins [r14 page 4], a sizeable number of Broadways were produced (approximately 54,000). In fact, more Broadways were made per production year than any other Model 57 grade!

Remaining Model 57 Watches

Vern Hawkins lists the production run of all the Model 57 grades: P grade (American Watch Co, Appleton Tracy & Co, C.T. Parker, Sporting, Central Park, Crescent Park, Martyn Square, Waltham Watch Co); and A grade (Waltham Watch Co, Am Watch Co, DH&D, Watson, P.S. Bartlett, R.E.Robbins, Wm. Ellery, Martyn Square, Riverside, Home Watch Co, Broadway, Sterling, Special) [r14 page 4]. Author has not yet seen evidence of any American Watch Co, Am Watch Co, Riverside or Sterling grade Model 57 movements.

"Sterling" grade movements 1367501-1369000 CA'79/80 have been listed in the literature as quick train (and stem wind), and possibly last run M57s, but author and others believe this reference is incorrect and that the last Model 57s made were probably Broadway S/Ns 1122001 - 1124000 (Oct - Dec '78) as seems to be indicated by listings in Serial Number Ledger [r1]. On the other hand, the [r1] listing for 1367501 definitely does not show the letter 'N' before F.T.F.P. which would have indicated "new fast train full plate", but neither do many other listings with even much higher serial numbers and no M57 has yet been reported with such a high number.

Custom Watches

The AWCo made many custom, private label/contract watches. A number of unique watches also exist which are believed to have been made by employees of the factory.

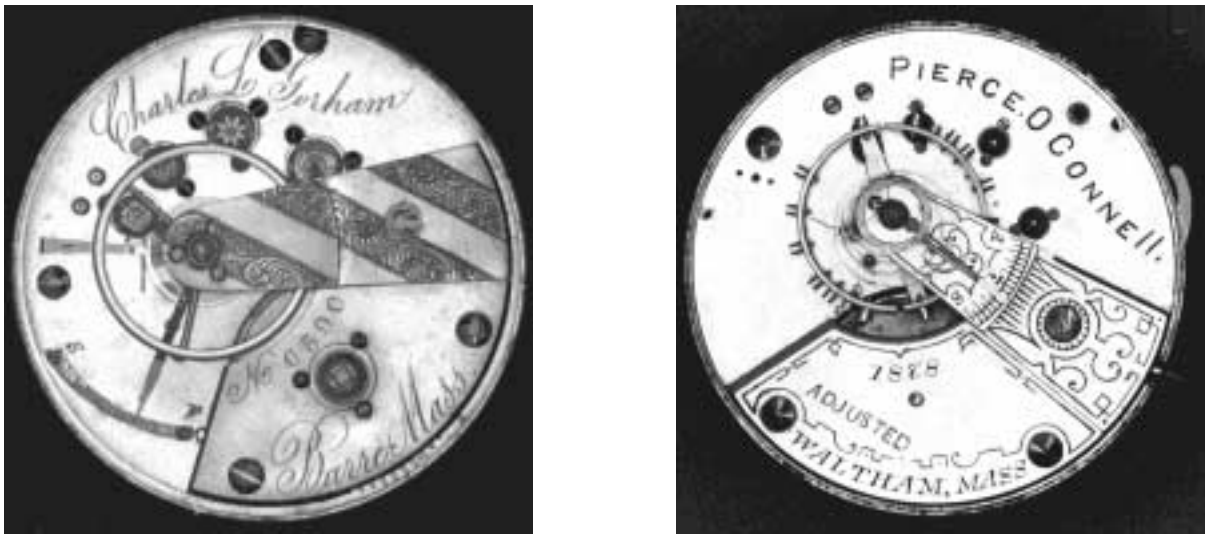


FIGURE 17. Example Private Label Model 57 Watches [photo of #1878 (its date) permission of Martin Cullen]

See example of nickel "employees" movement 914778 on next page (left). Picture of WWCo # 448110 (below right) with after market Teske micro-regulator permission of Hans Dahlke.

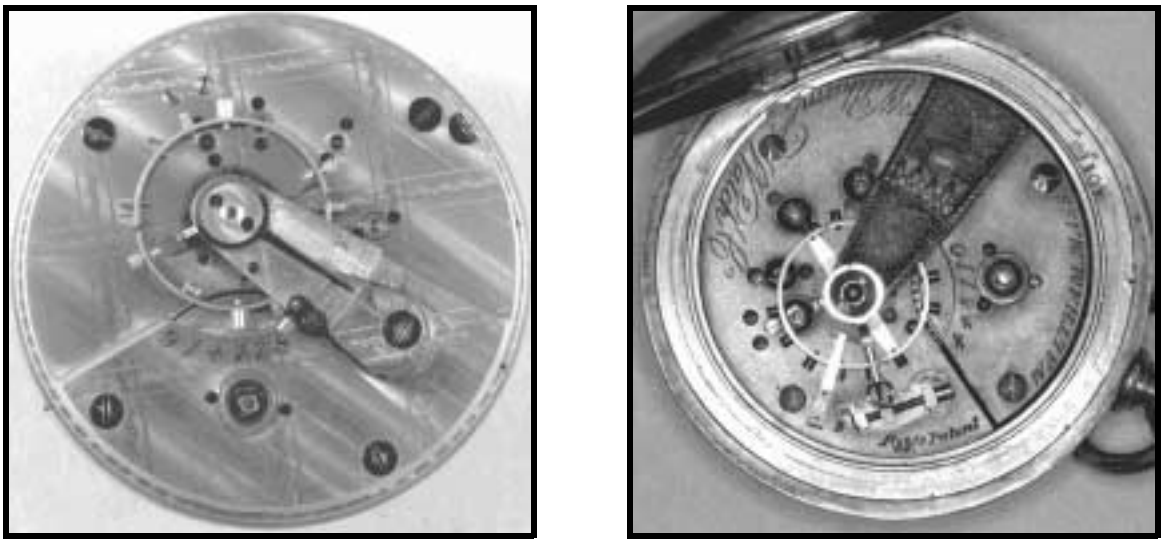


FIGURE 18. Example Custom Model 57 Movements.

Fake Model 57 Watches

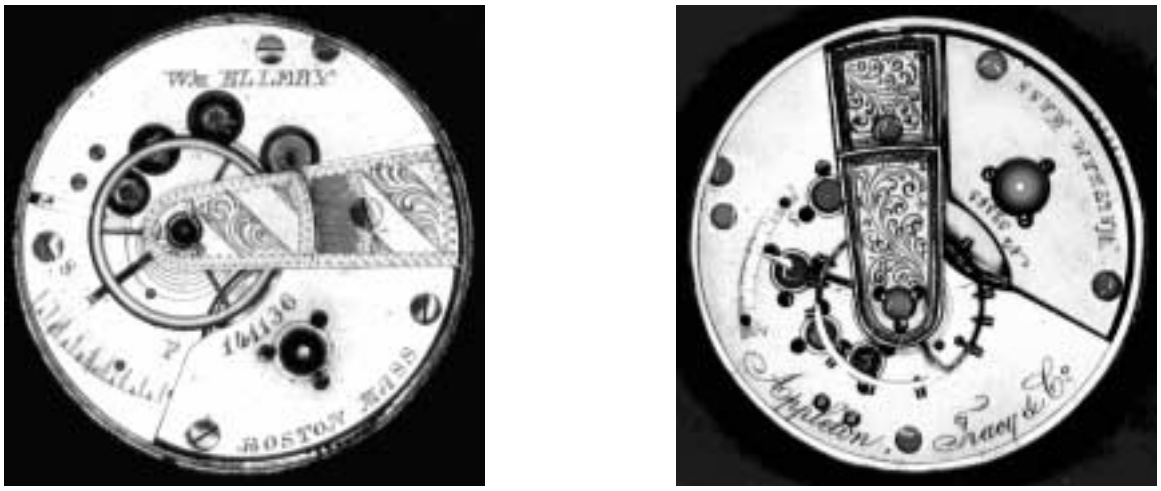


FIGURE 19. Fake Model 57 Wm Ellery and an AT&Co

The AWCo's watches became so popular and successful that foreign manufacturers began copying them. They are typically called "fakes", although they might be of better quality than the watch they copy. Here are two good fake Model 57s.

On the William Ellery "fake" (compare with Figure 11 on page 9):
- style of lettering of "Wm" and "Boston" is not quite the same as on a real Wm Ellery
- barrel bridge has different shape than M57s
- index is a little different and larger
- jewel holes are a little larger

On the AT&Co "fake" [quality watch with matching serial numbers on dial and case] (compare with Figure 14 on page 11):
- sprung under hairspring with hidden stud (although like an early PSB, not on an AT&Co)
- signature on wrong position on plate; script signature not used till approx. S/N 310000
- cock is different shape than M57s (look at position of mounting screw)
- solid closed fake compensation balance (different from even that employed on Wm Ellery M57)

Design Changes in the Model 57

The Model 57 incorporated many improvements and changes during its 25 year history. Many of these features are highlighted in picture below. Although too numerous to be described here in detail, the following feature changes are tracked and recorded in the author's data tables in his monograph. The listing order is by table order, not by importance.

- Position of Serial Number
- Style of Engraving
- Dials
- Stop Works
- Top Plate Encircling Barrel
- Number of Jewels, Type of Jewels, Jewel Settings
- Index Scale
- Balances
- Hairsprings
- Banking Pins
- Safety Center Pinion
- Dust Bands
- Escapements
- Types of Potances
- Style of Click
- Types of Mainspring
- various miscellaneous and trivia items

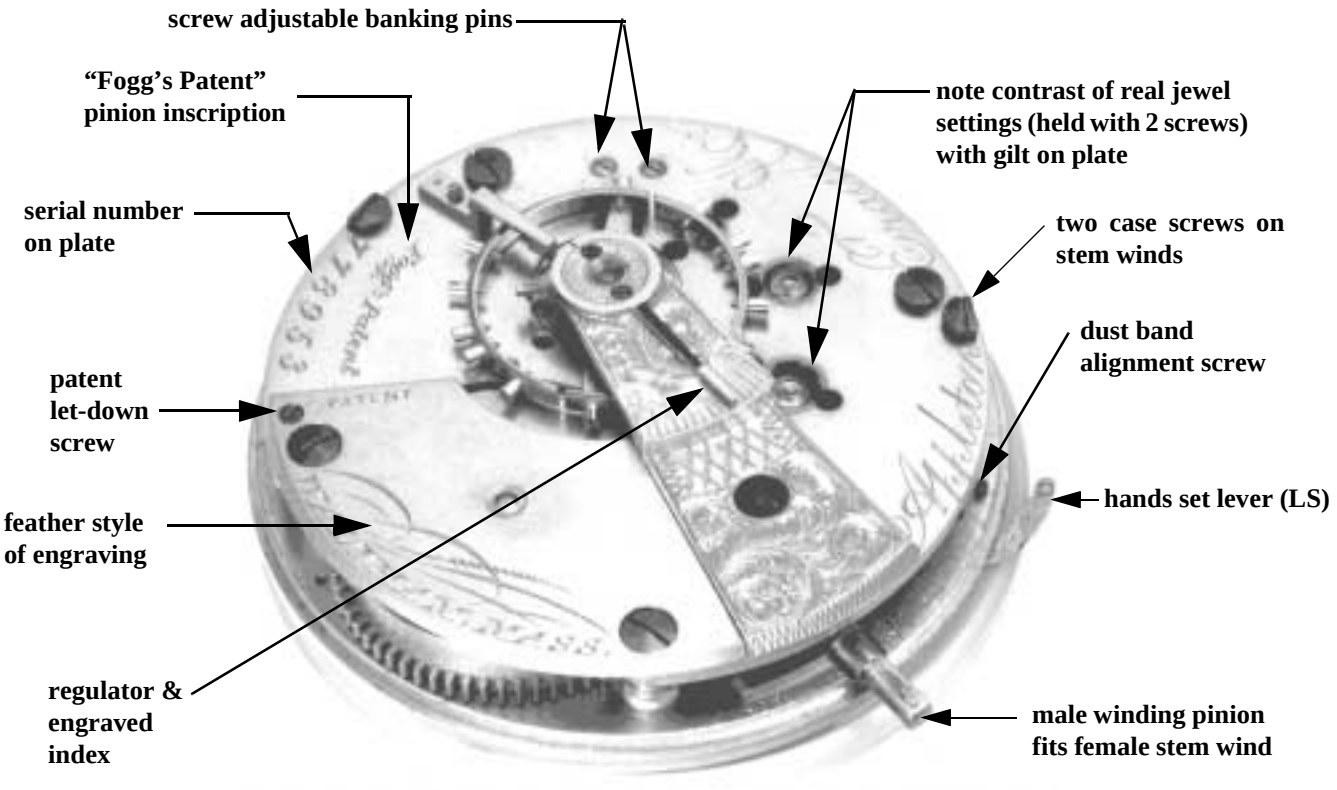


FIGURE 20. Appleton Tracy & Co Model 57 Stem Wind

Picture AT&Co SW 778953 permission of Tom McIntyre.

Stem Winding

Perhaps the most important improvement on the Model 57 was the introduction of the lever set stem wind movement. The standard winding and lever setting mechanism is illustrated on previous page in Figure 20 on page 15. Although employed on other models, the AT&Co grade LSSW Model 57 found acceptance among rail road operators for many years (even without the stem wind).

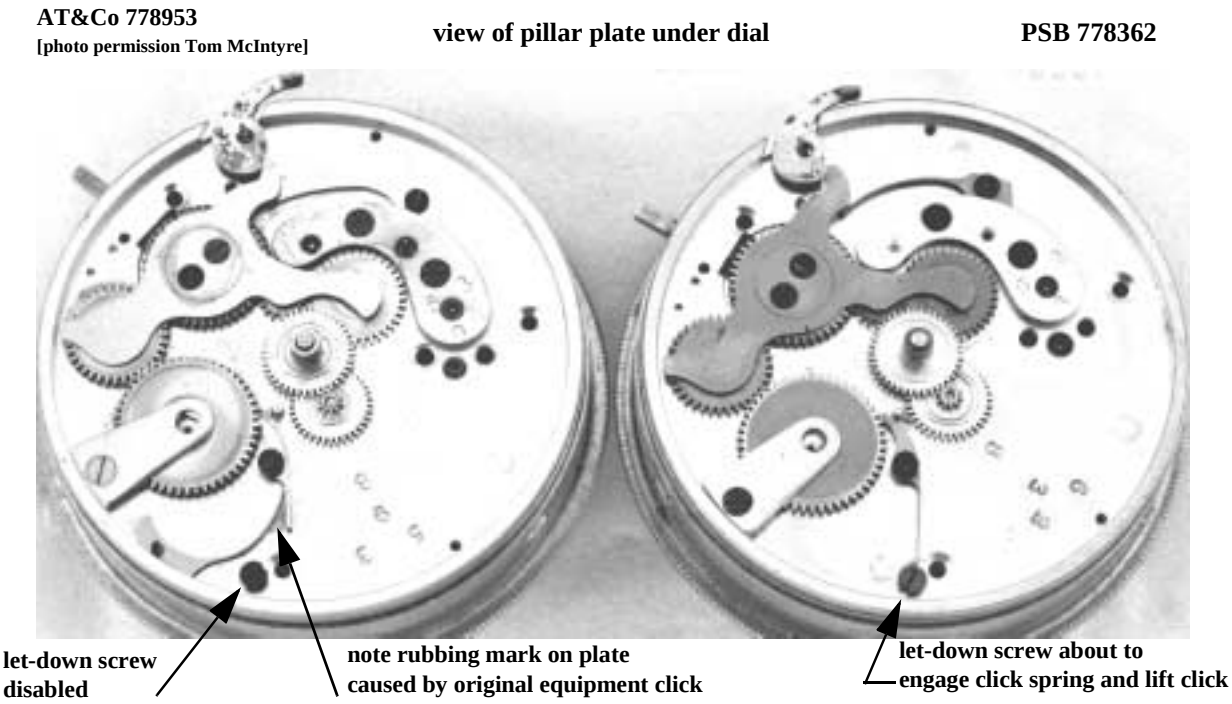


FIGURE 21. Click Let-Down on Stem Wind Lever Set Movements

The early stem winds with the lever setting mechanism were also fitted with a mainspring click let-down. The let-down screw appears at the edge of the barrel plate (see Figure 20 on page 15) and the let-down mechanism is located on the pillar plate (shown in the right-hand photo above). The main spring let-down is provided by this screw arrangement passing through the entire movement and out the barrel bridge for releasing the barrel click spring. This design was apparently unreliable and was phased out with removal of the let-down click spring (shown in left-hand photo above), and eventually even the let-down screw was removed.

Marsh credits Charles Vander Woerd with remodeling the original 18 size full plate movements to incorporate a stem winding mechanism, but claims they were very unsatisfactory [r5 page 46]. Two of Woerd's patents were employed: (1) the rocking-bar winding/setting mechanism illustrated above (#65,034, May 21,1867), and (2) the mainspring let-down feature described above (#101,398, March 29, 1870). The "rocking-bar" mechanism was designed both for winding the mainspring and setting the hands.

The "rocking bar" (or lever) was not Woerd's patent; that was invented by A. Lecoultre in 1846. Woerd's claim is that by hanging the fulcrum of the lever at the center of the wheel which is turned by the crown gear, the hands-setting mechanism is made entirely independent of the winding mechanism, and additionally the hands can be set in either direction.

Although there are exceptions, the first M57 stem winds were still key set (SWKS) as illustrated on next page (left picture). Not only are these watches key set, their winding train has no ratchet release so the stem cannot be turned backwards (apparently to offer stem winding at minimum cost).

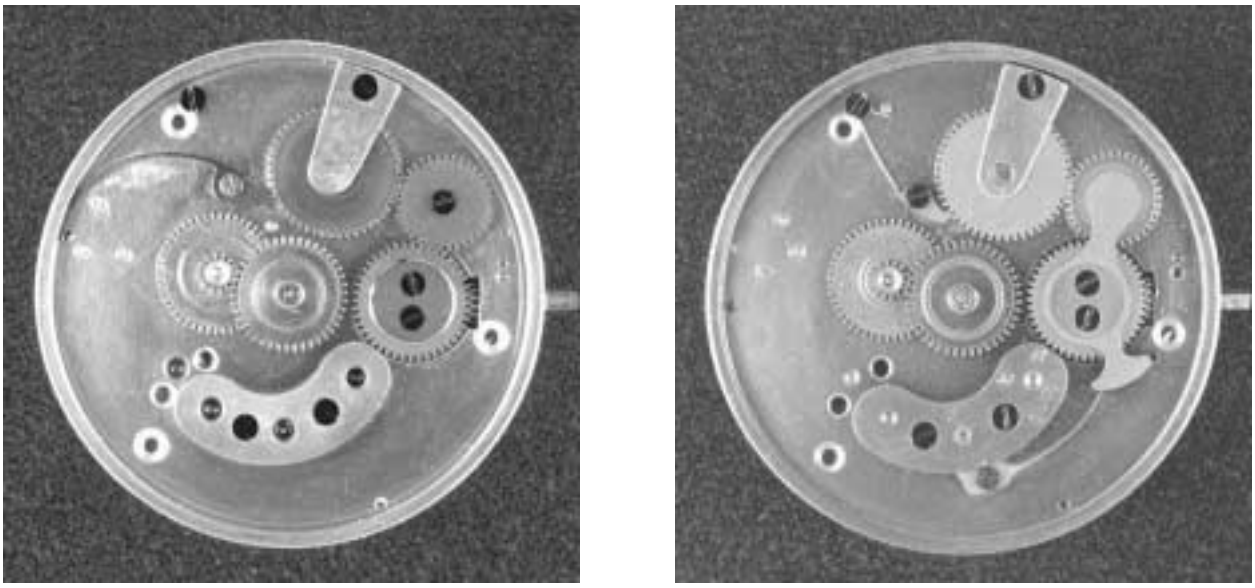


FIGURE 22. Waltham Watch Co. SWKS 597388 and Home Watch Co. SWKS 749376

Later HWCo grade watches were also produced as SWKS for lower costs (right picture above).

The stem cannot be turned backwards on the left movement in above figure because there is no release for the ratchet. Note that the let-down spring has been removed [photo permission of Joseph Brown]. The winding train is not extended for setting the time on the right movement. Note that the let-down spring has been removed, but the lower spring releases ratchet when stem is turned backwards.

Robbins later hired Duane H. Church to design a better stem wind, which he did in the Model 83 that fits both open face and hunting cases (winding pinion on movement is female).

Why the deficient transitional winding-only design was used many years after Woerd's patent was available is unclear; perhaps the answer is simply that for marketing reasons the better stem winds were being offered at that time only in the better model grades of watches.

Safety Center Pinion

Another very important feature was Fogg's safety pinion.

Crossman reports that Charles W. Fogg's safety center pinion was introduced in 1865 and was adopted on all grades during the years 1866-7 [r15 page 30]. This feature unscrews the center wheel pinion in reverse direction when the mainspring breaks (see picture on next page), thus protecting the train from damage.

See "Fogg's Patent" mark on movements in Figure 20 on page 15. From observation, Crossman's date appears to be about a year early for the Model 57. Also from observation, the safety pinion was added to the HWCo grade ten years later and never on the Broadway grade.

FIGURE 23. C.W. Fogg's patented safety center pinion (pinion unscrewed in picture)

Charles W. Fogg's patent safety pinion is patent No. 46,343, Feb. 14, 1865. This date is inscribed on the train side of the pillar plate, and the patent marking is inscribed on the top plate.

According to Serial Number Ledger [r1] and author's data tables, Fogg's safety pinion was not employed on Model 57 watches until around 1867 per [r1], or 1868 per the tables, two years after the patent. Why? Competition from the National Watch Company in 1867 probably had something to do with this subject because Fogg's safety pinion was offered on the high grade 3/4 plate movements by January 1866 per reference [r1].

Concluding Comments

In retrospect, some of the new features or changes on the Model 57 were probably unnecessary, but the vast number of them sure make collecting Model 57s a joy. Considering all of the improvements, and all of the design changes for marketing purposes, the company probably would have been better off not replacing the Model 57 with the next introduced full plate Model 70, Model 77 and Model 79 watches. The Model 57 could have likely satisfied the market until the Model 83 was introduced (but of course the powers to be didn't know that at the time).

Nevertheless, by 1879, 25 years after the Waltham watch factory open its doors, and after producing nearly a million Model 57 pocket watches [r14], the company was producing a large number of quality industrialized watches in a variety of models, grades and sizes, and made its mark as a world class manufacturing company. This was a magnificent achievement for the mid-19th century. The Model 57 had done its job!

Enjoy! -- *Ron Price*

References

1. Hand Written Copy of *Record Of Watches Made By The American Watch Company*, (no date or author). Available on loan from NAWCC Library.
2. William H. Keith, past president AWCo. (1861-1866), *A Family Tale*, 1883; 270 handwritten page document on *History of American Watch Making*, that includes letter from Edward Howard writing about events during period 1842 to 1857. Document currently in private ownership.
3. Insolvency Records at the Massachusetts Archives in Boston: Case No. 116 of Samuel Curtis
   - Sheet 1: April 15, 1857, Debtor's Petition of insolvency
   - Sheets 29, 96, 120, 147, 158, 162, 178, 188: Lists of debts proved at creditors meetings totaling $41,617.74 as individual, $101,309.75 as BWCo, $30,577.95 as member BWCo, all total $173,505.44
   - Sheet 139: July 16, assignee Jameson recorded received from sale of real estate and personal property of the Watch Factory $37,500; also $491.90 from "collections". Author cannot explain the $4,000 difference that Robbins recorded paying for the factory, $41,500 ($8,500 real estate & $33,000 for contents) [r8 page 314] although Jameson transferred the deed to Robbins for $8,500 [see Reg. of Deeds, Middlesex County, MA, Book 768, Page 176].
   - Sheet 153: filed Aug. 25, Interrogatories (23 questions) to Rice regarding removing property from factory; e.g., did Rice have contract with company about Feb. 1, 1857, in writing, where is it, what was lease, did Rice remove stock, tools and fixtures from the factory and what right did he have to do it, was the attached listing of inventory "A" the inventory of the factory on Feb. 2, did Rice remove part of this inventory, at the night before the sale, or before, did Rice remove movements numbered 4891 - 4910 inclusive and other movements, and so on. Of interest of the inventory in Attachment A ("account of stock in workmen's hands Feb. 2, 1857) is 100 movements 1/2 to 7/8 done, 1170 frames (pairs of plates), long list of parts in various stages of completion, with total value including case room $7,510.49.
   - Sheet 180: Oct. 15, Curtis' affidavit: "Until sale of some of my property... pledge security within three weeks of filing petition [insolvency]... had reasonable cause to believe I should be able to continue to do business and that I could pay all my liabilities."
4. *The American Watch Company*, Chapter L, Waltham (continued), pages 738-749, History of Middlesex County, Massachusetts, J.W. Lewis & Co., 1890.
   Also published as: E.A. Marsh and approved by R.E. Robbins (AWCo.), *History of Early Watchmaking in America*, The Keystone, Nov. 1892, Dec., Jan., Feb., Mar.,& Apr. 1893.
5. anonymous manuscript, probably written by E.A. Marsh in 1921 on the history of the Waltham Watch Company; Catalog Item RC-2, Waltham Watch Collection, Historical Collections Department, Baker Library, Harvard University.
6. A. Kleeb, *Watch Jewels of the Pas*t, NAWCC Bulletin, Apr. 1962, page 191.
7. Boston Newspapers at the Boston Public Library, Microtext Department:
   Boston Daily Advertiser, Tuesday, May 5, 1857, Page 3: ad by assignee Nathan W.C. Jameson announcing the auction sale of the Boston Watch Company estate (about 2 acres), large buildings, machinery, tools and stocks in the process of manufacture at 10AM on Saturday, May 9, 1857, on the premises. (Same ad was run through Saturday May 9; ditto in the Boston Daily Courier.)
8. Charles W. Moore, *Timing a Century*, Harvard University Press, 1945.
9. From the Waltham Sentinel, Thursday, March 13, 1856, *The Boston Watch Company*, submitted by F. Forgie, NAWCC Bulletin, Feb. 1968, page 143.
10. W. Hauptman, *Appleton Tracy & Co*., NAWCC Bulletin, Whole No. 103, Apr. 1963, page 690.
11. Roy Ehrhardt, *American Pocket Watch 1980 Price Indicator Identification and Price Guide*, Heart of America Press.
12. Michael C. Harrold, *Fulfillment Of American Industrial Watch Manufacture*, NAWCC Bulletin, Oct. 1999, pages 581-597.
13. Vernon Hawkins, unpublished manuscript, *Waltham Factory Sales Records Nov. 1857 to Dec. 1858*, Roy Ehrhardt, Kansas City, MO, 1983.
14. Vernon Hawkins, *Movement Production of the American Waltham Watch Co.*, 1982. See further discussion in *Production of Waltham Movements* by Vern Hawkins in "Vox Temporis", NAWCC Bulletin, Whole No. 251, Dec. 1987, page 476.
15. Charles S. Crossman, *The Complete History Of Watch Making In America*, reprinted from the Jewelers' Circular and Horological Review, 1885-1887.