

400-Day (and “Torsion”) Clocks Part 1—Basic Description & History by Verlyn Kuhlmann

I’ve been attracted to 400-Day clocks ever since I first saw one on my uncle’s fireplace mantel when I was a young boy. I watched it for a very long time and was mesmerized by the 4-ball pendulum rotating very slowly in one direction and then back in the other!

I learned later, after joining NAWCC (1978), that 400-day clocks are a type of “torsion” clock since they use a torsion (twisting) pendulum for time regulation.

There were several inventors of this form of clock using a torsion spring. Unquestionably, the first was **Aaron Dodd Crane** of Newark, New Jersey given U.S. Patent #1973 on 10 February 1841. The second American to patent a torsion pendulum clock was **Silas B. Terry** of Plymouth, Connecticut given U.S. Patent #9310 on 5 October 1852. A third American **John W. Hile** of Waterville, Kansas about whom nothing is known except that he was assigned U.S. Patent #176309 for a torsion pendulum clock on 29 March 1876.

In Germany, the origin of the 400-Day clock is usually credited to **Anton Harder** of Ransen who received a patent in Austria-Hungary in 1880 (Harder later applied for a U.S. Patent and was assigned #269052 issued on 12 December 1882).

400-Day clocks are also referred to as “**Anniversary Clocks**”. “**Anniversary Clock**” was a trademark registered in 1901 by a promotion-minded U.S. Importer (**Bowler & Burdick of Cleveland Ohio**) who saw the clocks as birthday or wedding gifts that could be wound each year on the anniversary of the event.

Most torsion clocks are time-only; however, there are some that have complications such as: strikers (passive); having calendar mechanisms; or moon-phase indications (these were not too successful!).

There are many types of torsion clocks: the most familiar is the 400-day clock. Also: **1000-day clocks**; **100-day**; **30-day**; as well as novelty **8-day clocks**. [“**Atmos**” & **Tiffany Never-wind**” clocks are also considered torsion clocks].

400-day clocks are made in a variety of sizes. The different types and sizes are: “**Standard**” (11-13” in height); “**Miniature**” (9-11”); “**Midget**” (6-8”); and over-size, called “**Louvre**” (15-20”).

The early torsion pendulums were plain “flat disks”. The design of these flat disks evolved into a more pleasingly esthetic shape by adding “galleries” (small-diameter narrow disks separated from the main disk by “turned” pillars) to the top of the disk. A series of “temperature-compensated” pendulums appeared. Currently, the most common types are the 3-ball or 4-ball pendulums.



This is a photo of some of the 400-Day clocks at the 2004 SWCA regional exhibit. All the varieties described above are represented. In addition

to familiar glass-domed protective-cases, some other case-types are shown at the front-left of the table: the brass & glass-housed (“**Bermuda Carriage Coach**” & “**London Coach**”); to the right of the “coaches” is the fancy

“**Mademoiselle**”. Back of the “**London Coach**” is a 3-glass (& brass) clock. (400-Day movements have also been housed in crystal regulator-type cases, and wood/glass cases [desk & wall]). In the center of the table are 4 loose pendulums (disk pendulum, with gallery at left). In front and to the left of the pendulums is a clock with a temperature-compensating pendulum [**the zoom-feature allows closer examination**].

Highly desirable auxiliary features are: “**clock levelers**” (adjustable supporting feet mounted on thumb-screws to level the clock); “**pendulum guide-cup**”, (a device fastened atop the clock’s base used to indicate proper leveling of the clock by comparing the lower extension of the pendulum to the cup’s center—this depends on the cup being properly positioned at the factory—I’ve found guide cups that were badly out of position); a “**suspension-spring guard**” (a protective shield surrounding the suspension-spring); “**pendulum locking-device**” (a means of safely supporting the pendulum to prevent damage to the very delicate suspension-spring when moving the clock. [NOTE: If a 400-Day clock does not have a pendulum locking device, the pendulum should be detached when the clock is moved so that the suspension spring is not damaged by a wildly dangling pendulum!])

Torsion clocks are extremely fragile and temperamental. They must be absolutely level: won’t tolerate any disturbances (such as vibration); and must be “in-beat”. [Troubleshooting 400-Day clock problems will be discussed in Part 2].

A special-interest chapter of the NAWCC, “**The International 400-Day Clock Chapter (#168)**” was established in 1996, and is one of the fastest (if not the fastest) growing special-interest chapter in the NAWCC (currently about 400 members). A quarterly journal “**The Torsion Times**” (with an average of 25-30 pages) is very informative. The official 400-Day clock reference of Chapter 168 is “**The Horolovar 400-Day Clock Repair Guide**” (10th edition) which was developed by **Charles Terwilliger**. The “Repair Guide” has undergone many changes/updates since it was first published in 1953 as the “**Horolovar 400-Day Clock Suspension-Spring Guide**”, and is indispensable for 400-Day clock repair (or reference by any serious 400-Day clock collector), in that it has: a fairly exhaustive list of 400-Day clock (actual-size) back plate illustrations, for use in identifying 400-Day clocks; a reference to size of suspension-spring and main-spring to use on each clock; many other 400-Day clock parts identifications; history of 400-Day clocks; a section on adjustment of 400-Day clocks; as well as answers to many frequently asked questions about 400-Day clocks.

I joined Ch168 in April of 1997. Ch59 member Rick Coleman was Ch168’s secretary from June 2005 through June 2006; Bob Garner had been a member.

Since Ch168 is a special interest chapter with members scattered around the world, there is no established meeting location. Meetings take place at the National Convention each year as well as at selected Regional conventions. A schedule of meeting locations is published in the “**Torsion Times**”. There was a gap in the meeting schedule which Ch59’s SWCA date filled perfectly. I requested that the SWCA be added to the schedule and Ch59 was added to the meeting schedule and met at the SWCA for the first time in 2008.