Newsletter of the Horological Tool Chapter #173 of the NAWCC

Tool Enthusiasts' Round-Up

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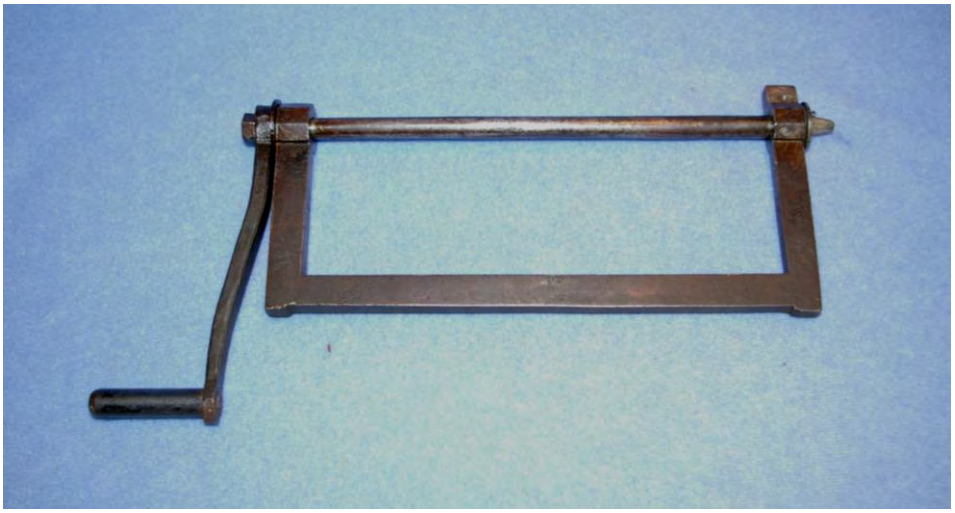
Upcoming Chapter Activities and Classified Ads



A Clock Chain Making Tool

Spring 2017

No. 31

The Horological Tool Chapter of NAWCC

The Tool Enthusiasts' Round-Up is the newsletter of the Horological Tool Chapter #173 of the National Association of Watch and Clock Collectors Inc., a non-profit educational organization. This chapter and its newsletter are intended to foster interaction among NAWCC members who share a common interest in the use and collection of horological tools of all sorts. If you have an item you have researched, a book of interest, or notes on a project you have made, please consider sharing your knowledge with others through the newsletter.

The annual chapter dues of $10 will ensure that members receive the newsletter and are included in the Membership Directory when it is published. Members are also entitled to one classified ad in each issue.

Board of Directors

Plan Ahead To 2018

The 2018 National Convention of NAWCC will be held in York, Pennsylvania. Richard Newman is heading up an effort to highlight the many specialty chapters of NAWCC. This will take the form of exhibits to showcase what each chapter specializes in and what they have to offer a new member.

Chapter 173, is planning to put up a display of clockmaking tools and some of our publications. We hope to put on a chapter meeting as well. This will be the first time Chapter #173 has held an east coast meeting since Harvey Schmidt died many years ago.

This event seems far away in the future but, it is not too early to plan. My plan is to drive east with some supplies for the exhibit and maybe some tools for sale. If you think you can contribute, please let me know. We also need someone to speak to Chapter 173 at our meeting as well as manage it.

Open to any ideas members might have.

Bruce Forman
Editor

An English uprighting tool.

Clock Chain Making

Early American tall case clocks use two different types of movements. One is an 8-day cable driven movement and the second is a 30-hour chain driven movement. Cable driven movements were more expensive to produce because both the time and strike train have independent winding drums. From these winding drums are suspended cables to support the pulleys and weights. In comparison, the 30-hour clock movement has fewer parts to make; so, it was less expensive. The 30-hour clock movement has only one clock weight which is suspended from a pulley and wound using an endless chain and two sprocket wheels, Figure 1.

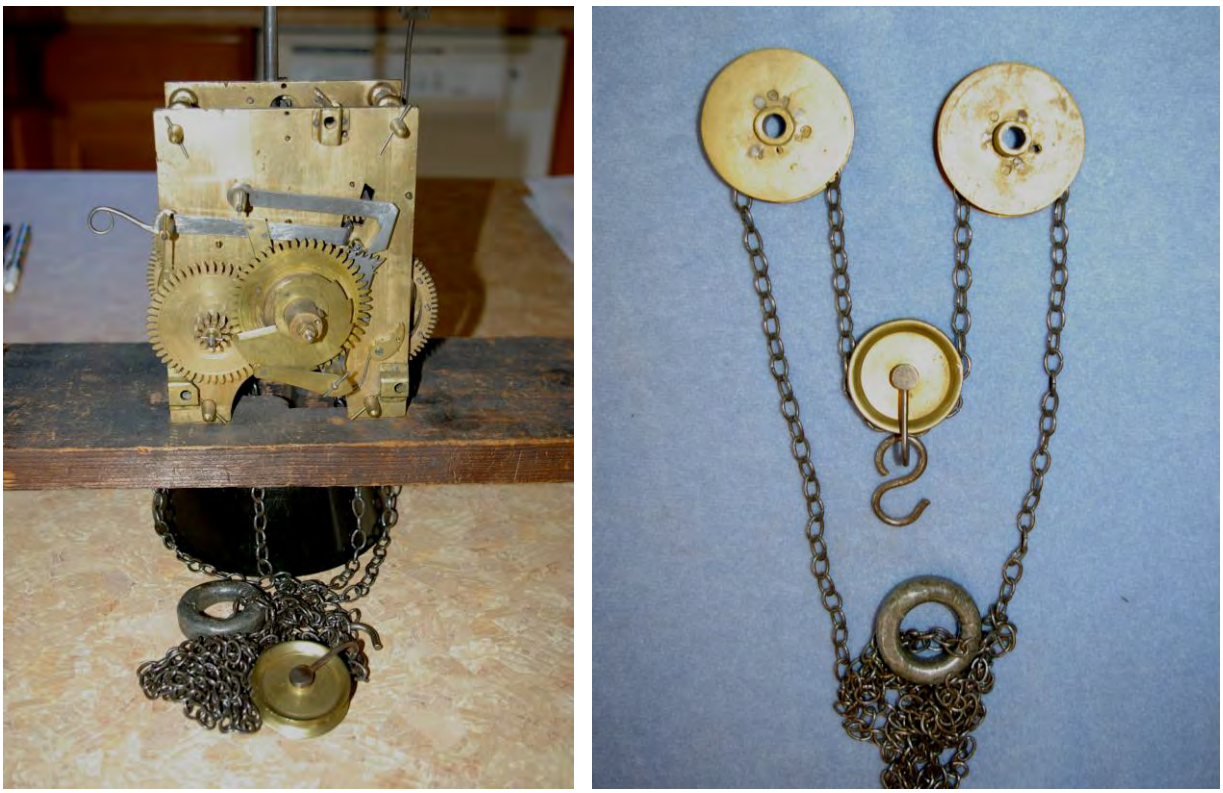


Figure 1. A 30-hour clock movement with endless chain drive.

It was once thought that 30-hour clock chains were supplied to the clockmaker by a person specializing in this trade. However, there is mounting evidence to suggest that many of the clock chains found on American clocks, were made by the clockmaker himself. This may explain why there is such a lack of standardization in their sizes.

As early as 1767, the inventory of American clockmaker, Rudy Stoner, lists a chain making tool along with a wheel cutting engine and barrel grooving tool. Stoner also owned lead and pewter patterns for casting clock parts. The Stoner inventory proves conclusively that at least one

American clockmaker made his own clock chain but, the author has not been able to find any written procedure from an account book or other horological source.

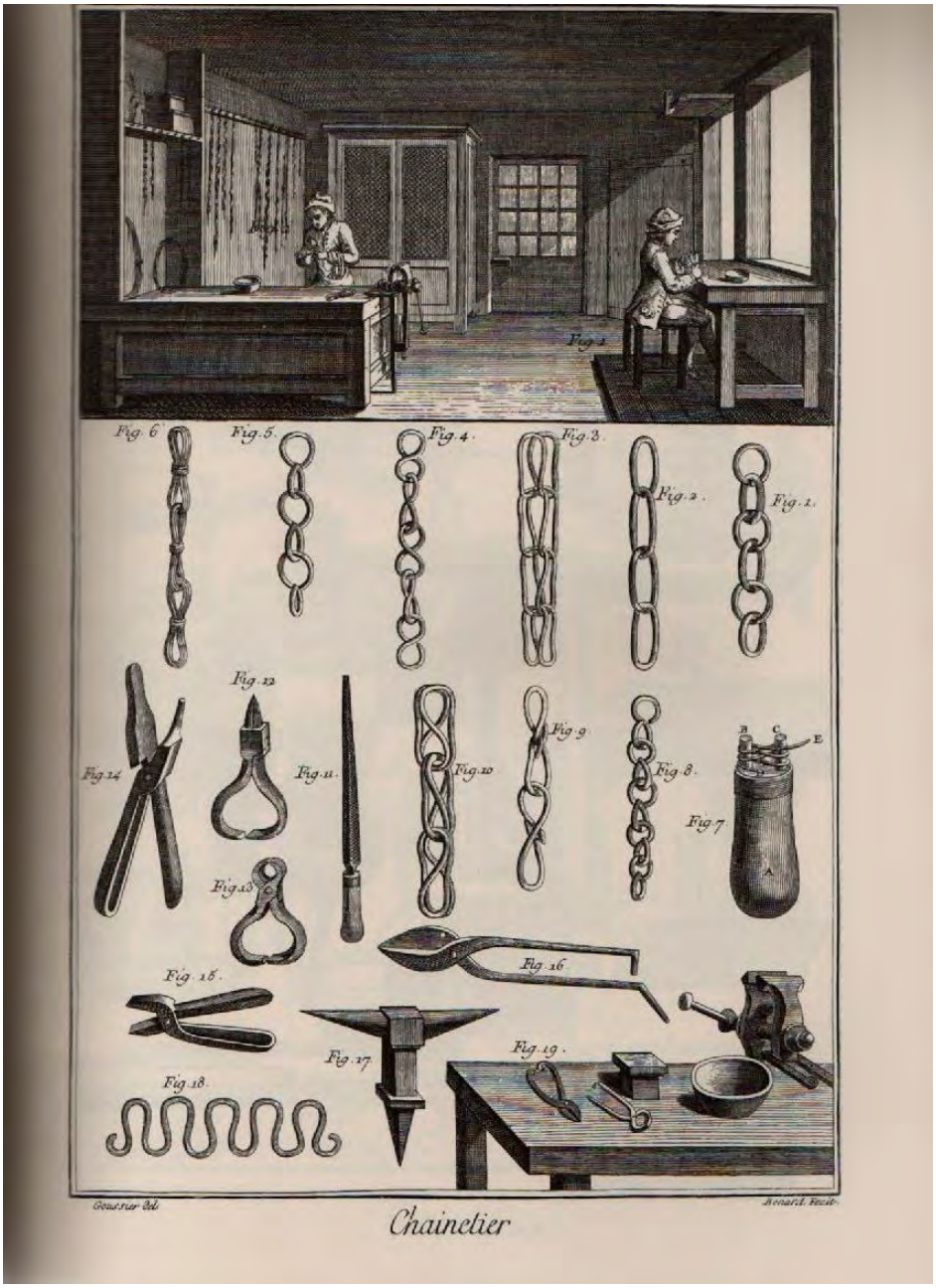


Figure 2. A print showing an 18th century chain making shop and tools.

The only information he has found to date, is related to general chain making in 18th century France. This takes the form of an engraved illustration in the Diderot Encylopedea, Figure 2. Diderot shows a shop that specialized in making nothing but chain. Chain links came in many different styles including round, oval, twisted and "S" shaped.

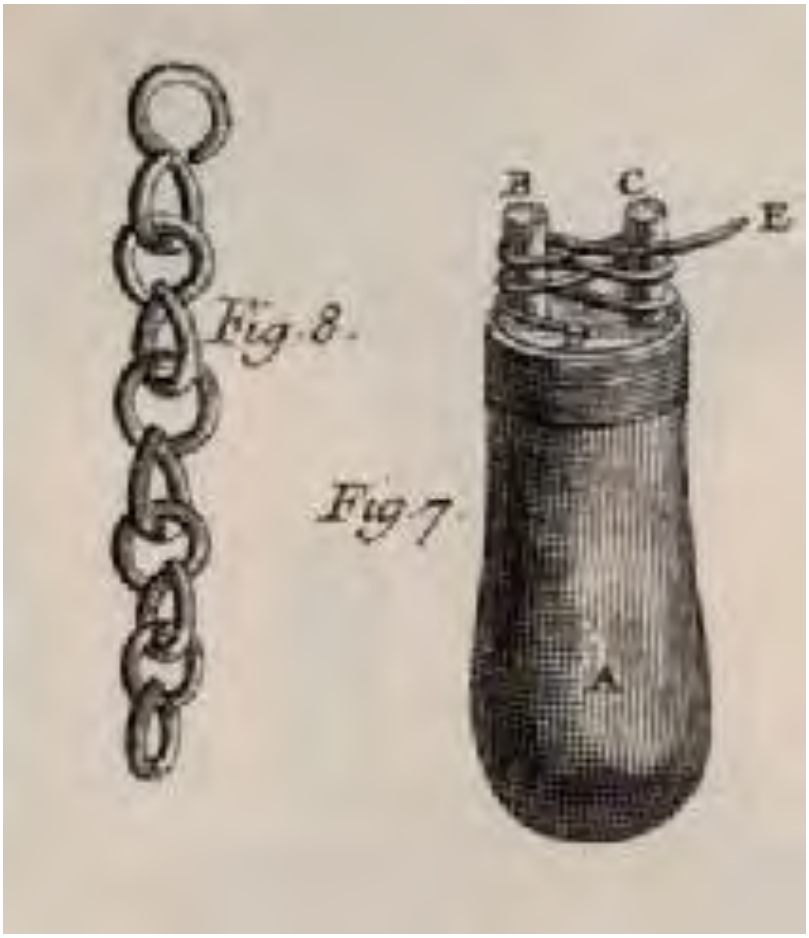


Figure 3. A tool used to form the chain links.

The tools in the shop are very simple and the chain making process appears to have been divided into three steps. First, the iron or steel wire was wrapped around a tool with two posts to form the shape of the links, Figure 3. Second, the wire was cut into individual links using a nipper. Third, the links were assembled using pliers, into long continuous chains for sale to the customer. Unfortunately, this is only the author's interpretation of the print, since he does not own a translation of the missing French text.

Before finding this print, the author believed that chain links might have been made by winding wire around a steel mandrel, a method used to manufacture coil springs. After the coil is formed, he supposed that the coil was slit lengthwise to form individual links that could be assembled into chain. Since clock chain links are oval in shape, the mandrel would need to be oval instead of the round shape used to make coil springs. An experiment was carried out to see if this method could actually be used to make chain.

Figure 4. Winding wire on a mandrel to make chain links.

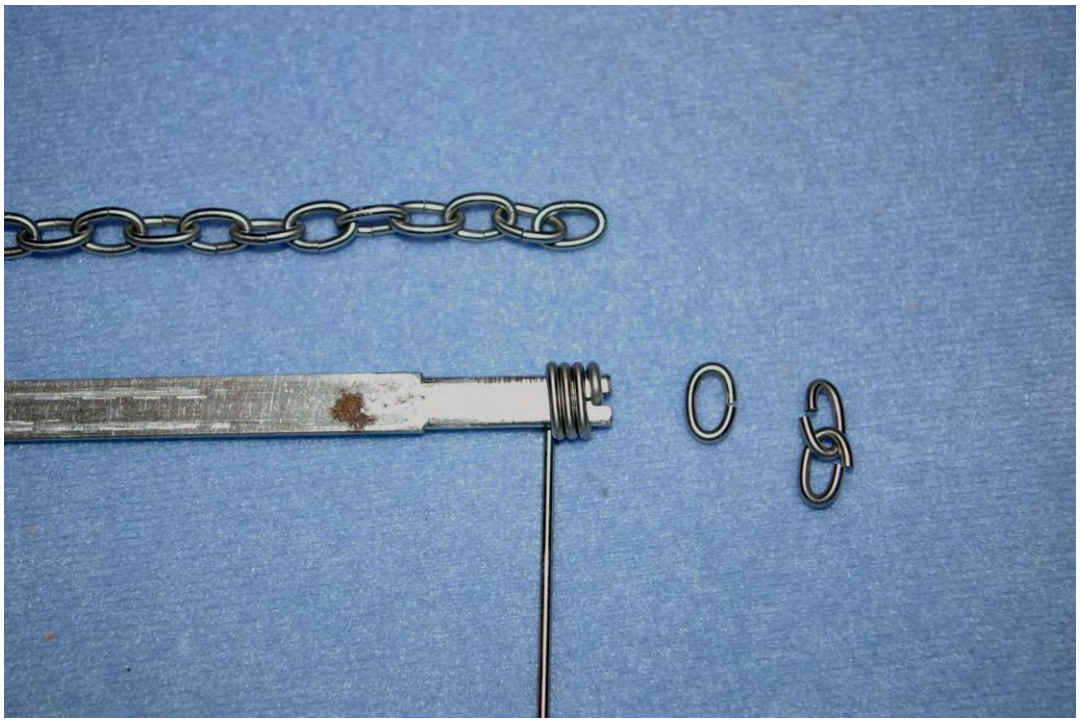


Figure 5. Winding, cutting, and assembling chain links.

Figure 4, shows an oval shaped mandrel mounted in a lathe. The end of the mandrel has a notch filed into it to hold the end of the wire to be wound. As the lathe is turned by hand, the wire is wrapped around the mandrel with a constant pressure. After three or four links are formed, the links are slid off the mandrel and cut with a jewelers saw, Figure 5. Tool marks from period clock chain show that nippers were used to cut the links. However, a nipper with enough pressure to cut the links was not available; so, a jeweler's saw was used. It takes about two mind numbing days to wind, cut, and assemble a clock chain using this method.

A more efficient method to make clock chain appeared on the pages of Horological Times, July 1990. This magazine is published by AWCI and a member developed a small device to make clock chain. Steel wire was first cut to length and was then bent around two steel pins spaced at the correct distance to form a link. This wire bending tool was hand powered using three long lever arms. The designer claimed it took only a few hours to make 11 feet of chain. Although this is an ingenious tool, it would have been a challenge to build in the 18th century using only hand tools.

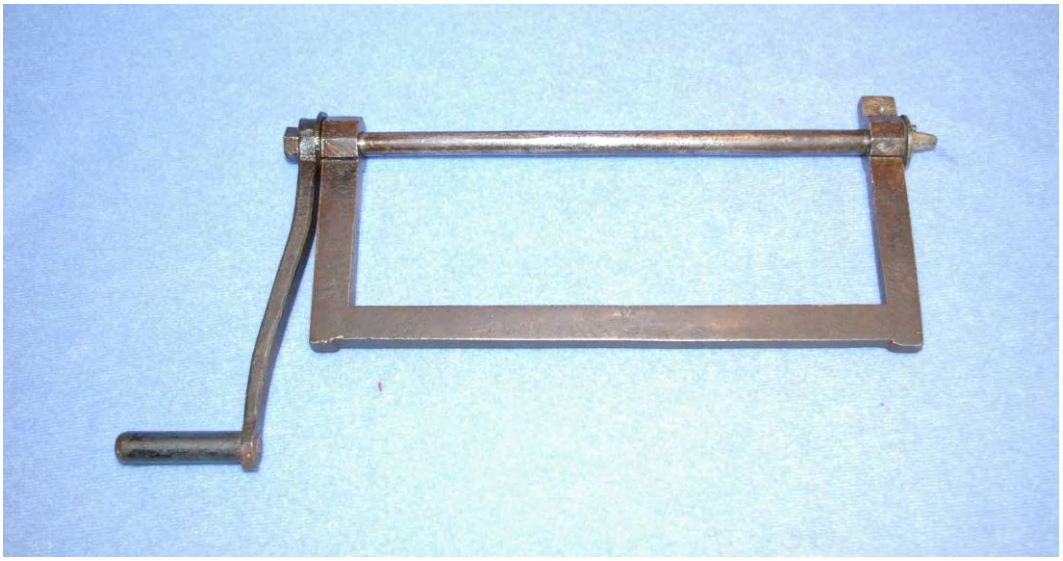


Figure 6. A tool described as a mainspring winder.

This brings us back to the question, how did 18th century American clockmakers actually make clock chain? Part of the answer comes from examining two collections of antique clock tools. The first was exhibited at the NAWCC Museum many years ago and consisted of a wheel cutting engine, barrel grooving tool, and a mainspring winder. These tools are believed to have been owned by an early clockmaker who worked in Lancaster County, Pennsylvania. Although one of these tools was described as a mainspring winder, it did not have the functionality to do this job, Figure 6. The nose of this tool is oval in shape and the size of a link of clock chain, Figure 7.

Figure 7. The nose appears to be the shape of a clock chain link.

Many years later, the author visited the clock tool collection at the Mercer Museum in Doylestown, Pennsylvania. Mr. Mercer was an eccentric collector who lived over 100 years ago. He traveled the countryside buying hand made goods and obsolete tools for his museum. He often bought out complete workshops representing everything from hat to clock making. Most people thought he was crazy to collect what most people saw as junk at that time but, because he collected anything and everything, many objects normally thrown away were preserved in his museum and nowhere else.

In this collection are two tools very similar to the alleged mainspring winder exhibited at the NAWCC Museum. However, these tools were accompanied by several links of steel chain. Checking the original accession books, we find that Mr. Mercer catalogued them as chain making tools. This attribution is believed to be correct since there were still people alive during Mercer's life who would have remembered their use when he catalogued them.

The author recently acquired the chain making tool that was exhibited at the NAWCC Museum and incorrectly described as a mainspring winder. Because the spindle rotates with a hand crank you might believe it was used to wind the chain links, much like the mandrel method shown in Figure 4. However, there is no notch or hole in the spindle nose to attach a wire for winding and the spindle nose is tapered so the links would want to slide off during bending, Figure 7. Possibly, there is something missing from these tools or we do not understand their function. The only purpose the author could find for this tool was to hold and rotate a link while applying emery to debur the cut edges of the links. This procedure is not easy to do and there is no evidence of ware patterns on the tool to suggest it was used for polishing links.

In conclusion, we know that a modern clock maker can make chain by wrapping wire around a mandrel or by building a chain link bending tool. In 18th century France, we know that chain links were made by bending metal wire around a tool with two posts and then cutting the links apart. In early America, we know of at least three chain making tools that do not fit any of the aforementioned methods to make clock chain. Do any of our members have experience with chain making or can come up with a plausible theory as to how these early American clock chain making tools were used……. I know I am stumped!

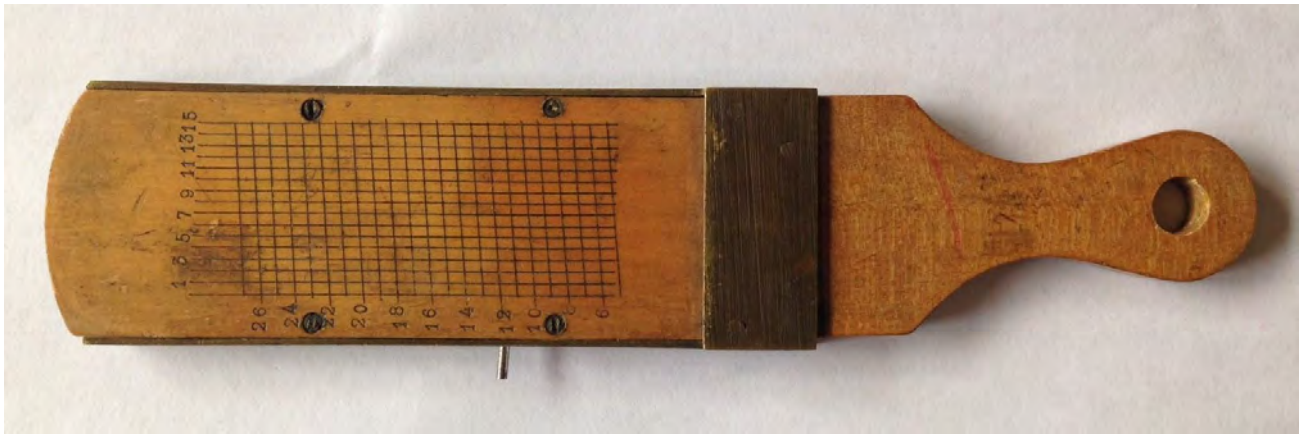
Bruce R. Forman

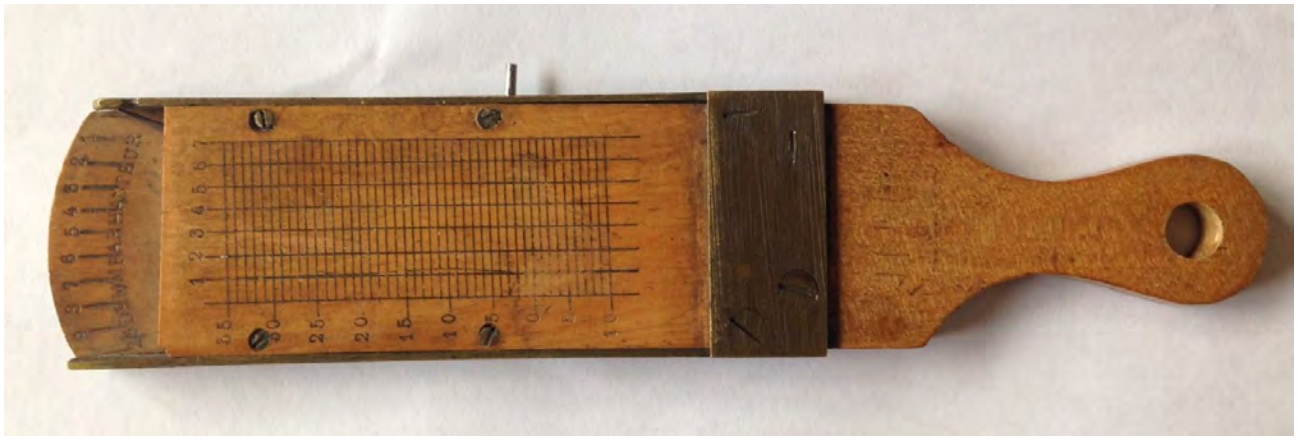
Different size clock chains.

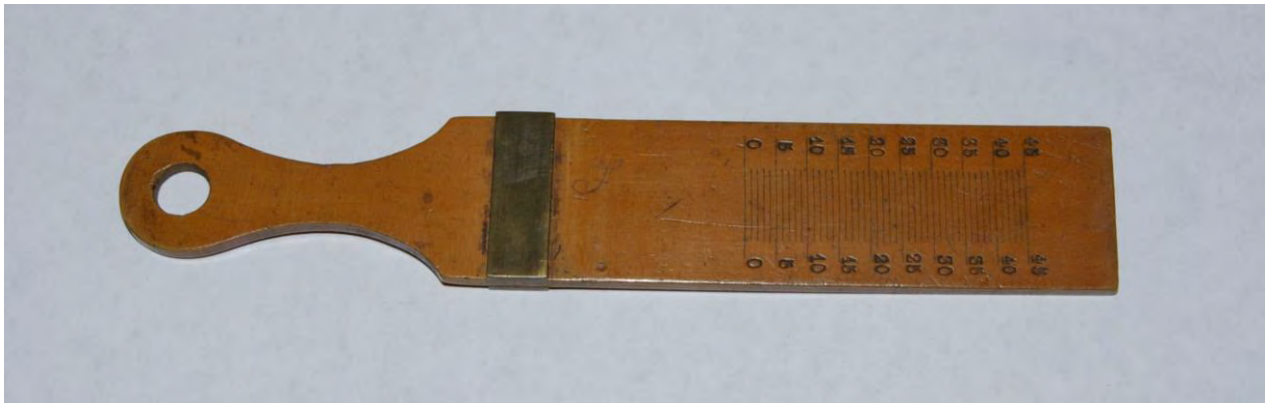
Reader's Feedback

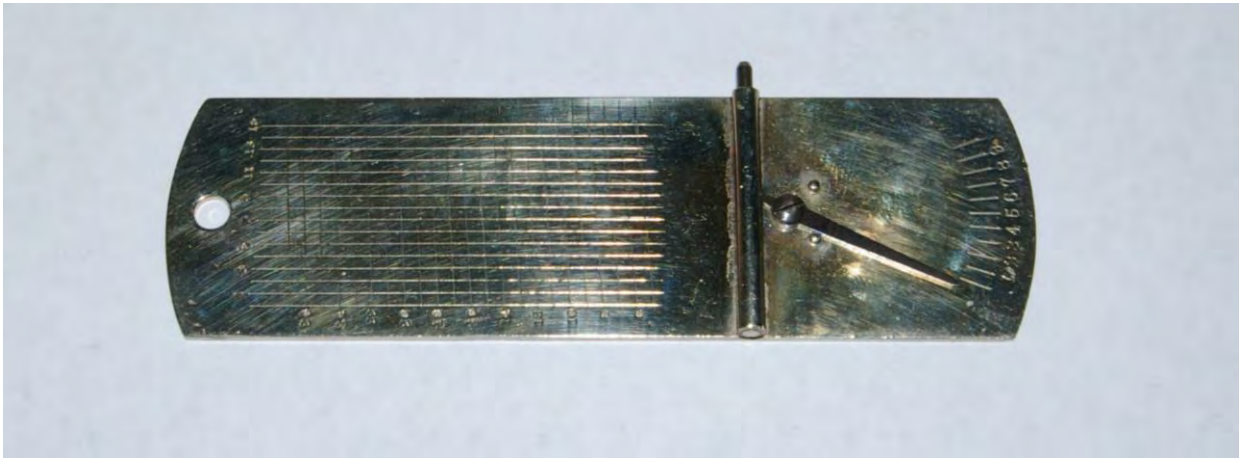
In the Winter 2016 issue of the Tool Enthusiasts' Round-Up, Mark Fulmer shared with members instructions on how to use a metal watch crystal gauge. This gauge was KRAEHMER's Patent and manufactured by the Hardinge Brothers of Chicago. Mark also included several examples of other gauges for measuring crystals.

Some of our members dug into their tool boxes and extracted some additional examples for members to see. We thank John Shallcross, Don Rossi, Price Russ, and others for sending their photos to the editor. We include these photos on the next 3 pages.







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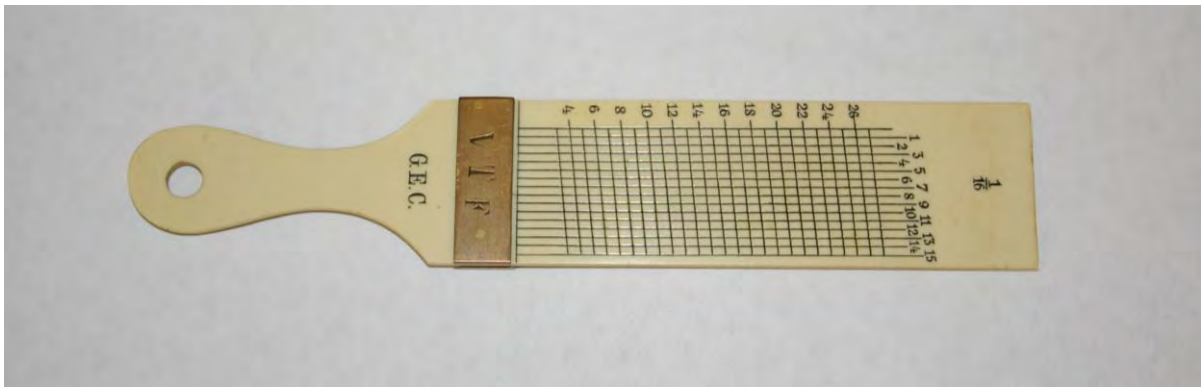

The variety of watch crystal gauges is almost infinite based on this small sample?

For Sale

Oliver jewlers cast iron draw bench. $600 or best offer. Mark Fulmer (330) 877-2021, Markusfu@hotmail.com