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September 1995

# British Horology Times

NAWCC CHAPTER 159

Douglas Cowan
Editor

## News FROM CHAPTER 159

Membership stands at 235 and no dues will be asked for 1995 except from new members. However we will need an on time response when the next dues are needed in January 1996.

Chapter 159 members Lehr Dercks and David Warner are to be congratulated on their election as Directors of the NAWCC. Also, two members were awarded Certificates of Appreciation during the recent national convention. These were Paul Odendahl, New Orleans, for his excellent work with this newsletter, and Bernie Pollack, Oceanside CA, for his membership recruiting efforts and for hosting the September Chapter 159 meeting in Del Mar. All of you members on the west coast please try to attend the meeting at the new **Pacific Rim Regional, Sept. 28-30 in Del Mar, California.**

The chapter's annual meeting was held on June 22, 1995 at the National Convention in Richmond Va. Fifty-one members and guests attended and a short business meeting was followed by two presentations. I showed some slides of the inside and outside of a ca 1777 Joseph Knibb table clock, and Tom Spittler presented an interesting study of the stories behind the chiming gongs in turn of the century hall clocks. Then a few very interesting clocks and watches were offered for examination and discussion. Lastly, the chapter was given a NAWCC President's Award for excellence in membership growth, research and the newsletter. Thanks to all of you who've made these things happen!

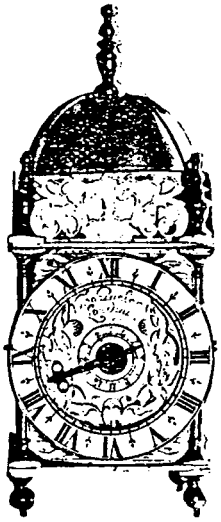
Tom and I have no interest in making your names and addresses available to non-members. However we have recently done so on two occasions when we thought that you would benefit. The first was a mailing to east coast members concerning member Fred Powell's fusee watch restoration workshop held in May. This was a unique opportunity to learn from a true craftsman. The second was for a free copy of the British *CLOCKS* magazine which was sent only to chapter 159 members. This attempt to build circulation coincidentally stated that Tom and I are writing a column for them.

## ENGLISH LANTERN CLOCKS

**By Frank Del Greco, Ohio**

English lantern clocks are exciting to collect. It is amazing how such ancient clockmaking techniques produced such wonderful examples. Yet, trying to find authentic clocks in good or restorable condition can be frustrating. As a collector, I would like to share information with chapter members, sharing what I've learned and providing some tips on dating these clocks.

Let us start with the basics: Just what is an English lantern clock? True English lantern clocks were made between 1580 and about 1720. They were constructed almost entirely of brass, having no case. Essentially all were of the single hand type, running for 12 hours with balance wheel regulation or 30 hours on a pendulum. No 8-day clocks are known to have existed at that time. All clocks were weight driven; many had an alarm (spelled *alarum* back then). The clocks were hung on a wall by an iron hoop. Movements had count wheel striking and fancy, tapered arbors. Movements were designed with the going train set directly in front of the striking train.



Thomas Parker, ca 1650

I like the fact that when I look at a lantern clock, I'm viewing the work of one person. In contrast, when I look at a longcase clock I see a marriage of three craftsmen: first the casemaker, then the dial engraver, and finally (if I remove the hood) the

*See LANTERN CLOCKS, page 2*

*LANTERN CLOCKS, from page 1*

clockmaker.

Lantern clocks were made completely by hand. Molten brass was poured out onto sand, then hammered flat. The surfaces were filed parallel, then scraped and polished smooth before working into a dial or a wheel. Screws and wheels were cut by hand.

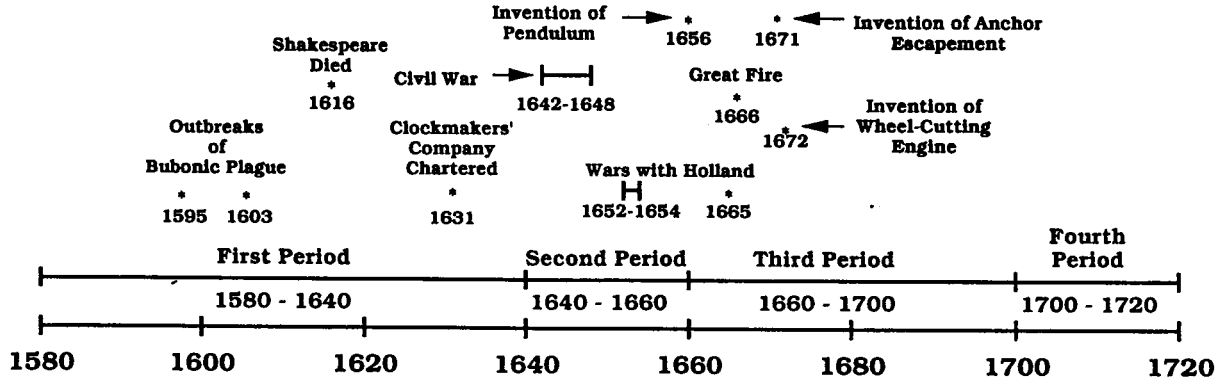
To appreciate a lantern clock one must put oneself back into the 17th century for a moment. Back then a clock was the most expensive personal possession one might own. In the first half of the 17th century, only the wealthy could afford a clock, and then just one. For that reason, these clocks had a very loud bell so the owner could hear his one clock from anywhere in his house (or palace!). It was also the only way one could tell time at night without striking a lamp. A lantern clock cost around £10 in the 1600s, which represented at least several month's pay. (Note: Records show that in 1608 a shepard made about £2/year, plus board; in 1680 a shopkeeper earned about £50 /year.) For that reason a lantern clock was called a "great chamber clock" as late as the 1640s; it wasn't until the 1800s, long after the demise of the clock, that the term "lantern" became popular.

Balance wheel regulated lantern clocks of the 1600s were only accurate to about plus or minus 15 minutes a day, but when you consider that the owner set the time based on a sundial after struggling with the equations of time, accuracy didn't matter. (How many sunny days do you find in London anyway?) In fact, since the clock required winding twice a day, the opportunities for forgetting and having to start all over again were prevalent. Fortunate was the owner who lived near a clock tower!

Now let's talk about dating these

**Figure 1**

**Lantern Clockmaking in London, 1580 - 1720**




clocks. There were four recognized periods when lantern clocks were made in England. These are shown graphically in Figure 1, along with events that affected clockmaking. During the transitional period, lantern clocks faded away in favor of the longcase. Although lanterns were made as late as 1800, these lacked the traditional style and character that I will describe.

Lantern clockmaking began in London. It took several decades for London fashions to drift out into the country, so it is important to take that into consideration when dating a provincial clock. The latter might have features well out of favor in London a quarter of a century earlier.

The earliest known English lantern clock was made in 1580 by Francis Nowe, a Dutchman. London clockmakers generally learned their metalworking skills from locksmiths and blacksmiths. Some events helped clockmaking, such as the formation of the Worshipful Company of Clockmakers in 1631. Other events, such as the bubonic plague, killed 30% of the people in London, including many early clockmakers.

English lantern clocks can best be dated by examining the dial, chapter ring, frets and hand. **First period** clocks, made between 1580 and 1640, are easy to identify if you can find one unaltered. The dials of these clocks contained engraved Renaissance ornamentation and classical architecture. The spandrel areas were often filled with foliate and floral patterns. Around 1620 the dial center design changed to scrolling leaves and flowers interspersed with grotesques. Figure 2 shows a good example. The flow of flowers on the dial plate is continuous; there seems to be no starting or stopping point. Most first period clocks had alarms. The numbers on the alarm discs were roman numerals. Chapter rings were quite narrow. Frets contained vases and grotesques. The hands were simple spears. The maker's name was usually engraved below the chapter ring. An interesting feature often encountered is that the heavy stroke on the numeral

*See LANTERN CLOCKS, page 3*

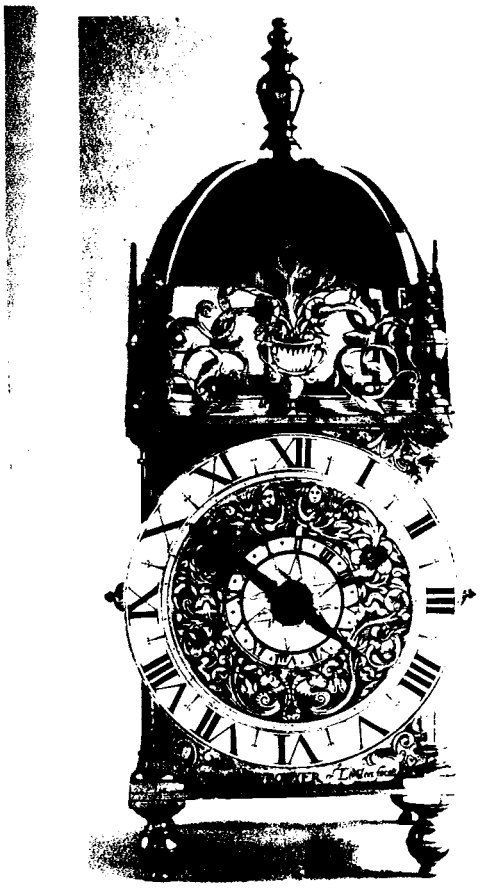


Figure 2. First Period Clock
by William Bowyer

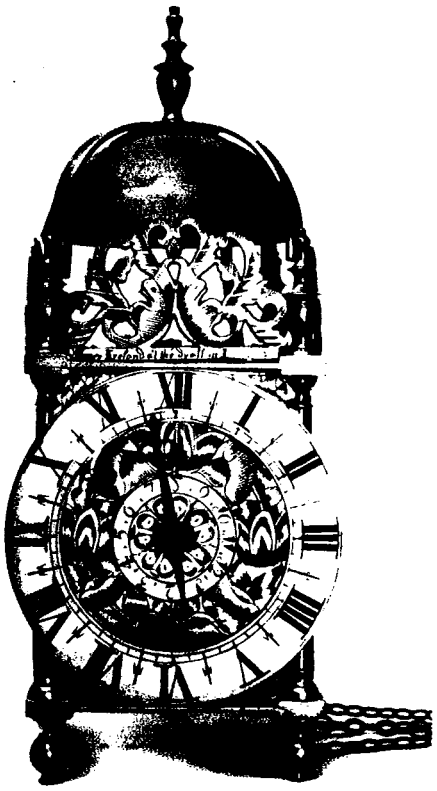


Figure 3. Second Period Clock
by Henry Ireland

***LANTERN CLOCKS, from page 2***

"X" was often reversed.

All first period clocks used balance wheel regulation and ran for 12 hours, as the pendulum had not yet been invented. As there was no maintaining power, the clocks stopped upon winding and needed to be restarted. Adjustment of the regulation was done by adding or removing lead from the main weight.

Some famous makers of first period clocks include John Cattle, Henry Stevens, Peter Closen, William Bowyer and Francis Forman.

Complete and fully original first period clocks are very rare indeed, not only due to age but because the majority of balance wheel clocks were retrofitted with a pendulum after its invention to improve accuracy and boost the interval between windings to an astounding 30 hours. A decent first period balance wheel clock, if you can find one, might cost over $10,000.

The **second period** of lantern clockmaking, 1640 to 1660, brought no changes in technology. War slowed the advance of clockmaking. However both the style and technique of dial engraving changed.

In second period clocks, one finds that much of the shading and cross-hatching used in dial engraving by first period makers has disappeared. See Figure 3. In addition, dial centers were now engraved with peonies, marigolds and sunflowers. These grew upwards from a base above the VI to another central or ending point below the XII. This makes a second period clock easy to distinguish from those of the first period.

***See LANTERN CLOCKS, page 4***

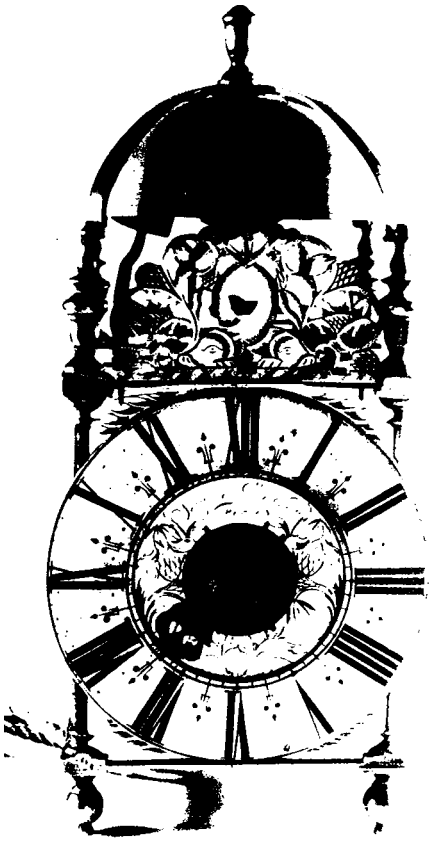


Figure 4. Third Period Clock
by Sammuel Macham

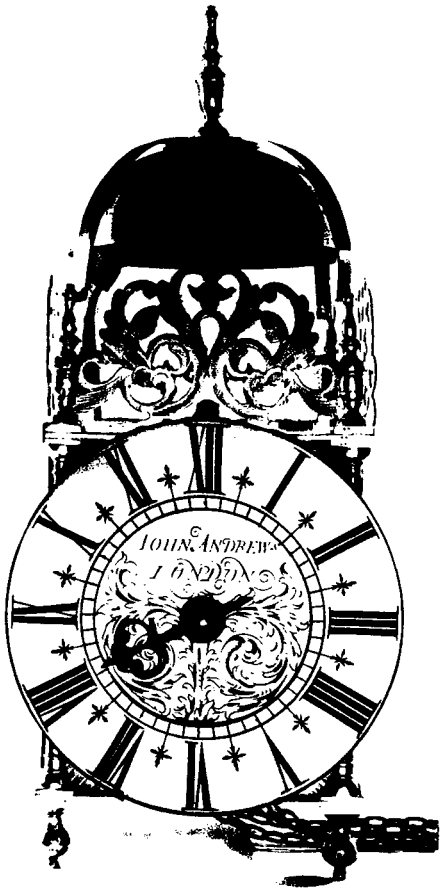



Figure 5. Fourth (Transitional) Period Clock
by John Andrews

*LANTERN CLOCKS, from page 3*

Spandrel areas were filled with petals. Chapter rings got a little wider. The maker now signed his name above the VI, below the XII, or on the fret. Alarms were common, but the numbers on the discs were now arabic. The frets contained dolphins, and the hand usually had a closed loop.

The one significant technical advancement which took place at the very end of the second period was the invention of the pendulum and endless rope system, usually credited to the Dutch astronomer Christaan Huygens van Zulichem in 1656. However due to two wars with Holland, the pendulum was not generally adopted by English clockmakers until about 1670.

The **third period** of lantern clockmaking, 1660 to 1700, brought both style and technological changes. Beside the recent invention of the pendulum, the anchor escapement was developed in 1671. And in 1672 the wheel cutting engine was invented.

Third period English clockmakers suffered a major loss. In 1666 the great fire of London devasted the Lothbury area where many clockmakers operated. Many makers were killed.

Third period clocks can, as usual, be distinguished from others by examining the dials. See Figure 4. Only tulips were used as the "flower of the period". The tulips seemed to sprout from the VI and end about three-quarters of the way up the dial center. This left room for the maker's name that was usually engraved below the XII. Chapter rings got noticeably wider, up to one and one-half inch. Alarm discs got smaller. A distinguishing feature of the period

*See LANTERN CLOCKS, page 5*

*LANTERN CLOCKS, from page 4*

was that the "8" on the disc had a flat top, and the "1" often resembled a "J". Hands got shorter and more ornate. Frets contained dolphins and were nearly indistinguishable from those of the second period.

Although the pendulum was invented in 1656, because of the wars with Holland it is very rare to find a pre-1670 clock with original pendulum regulation. Even the wheel cutting engine was slow to be adopted; many clocks made after 1680 still had all handcut wheels.

Some two-handed clocks were made in the third period, but acceptance was extremely limited. People just couldn't figure out how to read them! This accounts for the fact that even longcase clocks made around 1725 still had quarter hour and half-quarter hour markers.

A few fads occurred during the third period, the most notable being the center-swinging pendulum which was situated between the front (going) and the rear (striking) trains.

Toward the end of the third period the pendulum really caught on. So much so, in fact, that existing clocks were converted from balance wheel to pendulum regulation by the hundreds, often by the original maker! Many were converted first to the verge and short pendulum, then to the anchor and long pendulum, This brings up a significant point: Many converted clocks have recently been reconverted to balance wheel regulation in an attempt to increase the clock's value to the unsuspecting collector. Worse yet, clocks that were originally made with pendulum regulation are being retrofitted with a balance wheel, again to increase their value. Experts are making these modifications, so one needs to know what to look for to spot a forgery or conversion.

"Some two-handed clocks were made in the third period, but acceptance was extremely limited. People just couldn't figure out how to read them!"

The **fourth, or transitional, period** of lantern clockmaking occurred between 1700 and 1720. The market was now dominated by the longcase clock. Lantern clocks began to die out. Although some lanterns were made as late as 1780, they lack the character of the traditional clocks that I've been describing.

We can once again refer to the dial to recognize a transitional period clock. See Figure 5. A new foliate design based upon classical, scrolling acanthus leaves often filled the dial

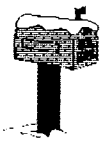
*See LANTERN CLOCKS, page 10*


This issue of British Horology Times contains three articles by authors new to the publication. They are all interesting and well done. How about more of you contributing in this way, in order to share and increase your knowledge?

Another ongoing research/article project is underway with Paul Odendahl. It's the study of clockwinders as proposed by Paul in BHT5. It is pleasing to report three very useful responses from you on this subject. They cover ancient days (ca 1700), the 1950s in England by a member who actually had that job, and some 20th century commercial clockwinding in Chicago. Please send me anything else you might have or know on the subject, in the next few weeks. Thanks!

*Doug Cowan, 110 Central Terrace, Cincinnati OH 45215*

**IT'S EMPTY!**



Just like this space

The Editor would welcome letters expressing new ideas, applause, criticisms, questions, corrections, suggestions, applications for new membership, and of course new articles for publication

His mailbox is stuck. Help him warm it up with your valued input. His name and address appear twice on this page in type that you can read

**BRITISH HOROLOGY TIMES**
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# THE GLEDHILL-BROOK TIME RECORDER
## EMPIRE MOVEMENT, FUSEE COMPENSATED

By Bernie Pollack, California

The Gledhill-Brook Time Recorder Co., Ltd., Ruddersfield, England was in continuous operation from 1912 to 1964 and during that time produced and marketed an estimated 50,000 recorders. In the United States interest in the GBTR as a collectible appears to be growing. And no wonder! If you ever have a Gledhill-Brook product you will understand why they are considered the "Rolls-Royce" of time recorders.

The great majority of these recorders were mechanical units powered by the spring driven, fusee compensated EMPIRE movement with a Graham deadbeat escapement. A smaller, spring driven movement with a platform escapement was used in the short case, portable, and desk models but was not stamped "Empire". This paper will concern itself with the EMPIRE movement only. Following papers will cover other aspects of the Gledhill-Brook Time Recorder (GBTR).

The most frequent questions on the GBTR received from collectors relate to disassembly, main spring set-up and reassembly. In this first paper I will try to cover these points as best I can. It must be remembered that not all readers will agree with my procedures. Hopefully this will generate constructive comments through the British Horology Times.

The plates, front and back, are heavy brass: 0.125 in. (3.18 mm) thick. However a few units were made with steel plates (brass plated) during WWII when all available brass was used for shell casings. Pivot holes are countersunk on both sides but not bushed. All components of the movement are precision machined to a close tolerance and all pivots are hardened and polished. The inside diameter of the mainspring (going) barrel is 3.082 in. (78.28 mm) and the diameter of the mainspring arbor is 0.866 in. (21.996 mm). Mainspring W=1.5 in., L=135 in., and T=.025 in. The fusee chain has 273 links, each link measuring .264 in. making the chain a fraction over 6 ft. long. The chain is capable of supporting a 56 lb. weight. When fully wound the movement was made to run for eight days.

### LET DOWN AND DISASSEMBLY:

Like all spring wound movements the mainspring must be let down before starting disassembly. I would strongly suggest that the clock be allowed to run down completely (full fusee chain wrapped around the spring barrel) before starting the let down procedure. because the mainspring is so powerful in the wound position and the heavy T-handle key used for winding (or letting

*See GLEDHILL-BROOK, page 7*

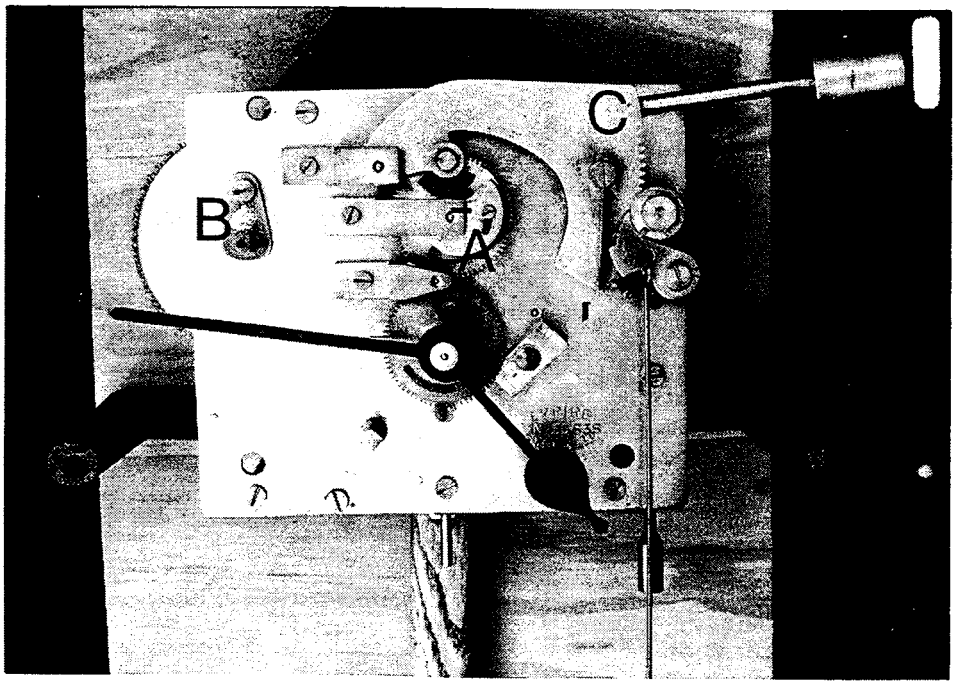



Figure 1. The fusee compensated EMPIRE movement used in Gledhill-Brook time recorders. Parts discussed in the text are: cam **A**, spring arbor retainer **B**, and lever **C**.

*GLEDHILL-BROOK, from page 6*

down) so awkward, "busted" fingers and a broken fusee chain can result if the key gets away. By letting the clock spring run down normally you then only have to deal with the set-up tension on the spring, usually one and one-half to two turns of the key.

With the T-handle held firmly on the barrel spring arbor, remove the machine screw fastening the spring arbor retainer **B** (Figure 1) to the front plate. Slowly allow the T-handle to rotate in a counterclockwise direction until all tension on the spring is released. You can then unscrew the machine screws on the rear bridge (retains the verge assembly) and lift off. The verge assembly can now be removed. Remove the three cocks that retain lever **C**, cam **A** and the cannon pinion assembly. These assemblies can be lifted off, the four machine screws fastening the front plate to the posts can be removed and the plate lifted. A crucial next step is to remove the hook that attaches the fusee chain to the fusee and carefully unwind the chain from the spring barrel, avoiding any kinking. All the remaining parts, including the fusee assembly, can now be removed, cleaned and lubricated. Unless a spring winder is available that is capable of handling the powerful barrel spring do not remove it from the barrel. However you can pop off the barrel cap and lubricate the spring if necessary.

**REASSEMBLY:**

With the back plate down, assemble all the movement parts except for the verge assembly. Next, place the smallest hook on the fusee chain in the slot of the spring barrel in such a position that it catches when the barrel is turned counterclockwise. The entire chain can then be wound around the barrel by rotating the barrel slowly in a counterclockwise direction. The end of the fusee chain with the long hook can now be attached to the fusee cone in the slot provided. Keeping the slack out of the chain by maintaining a slight tension on the spring barrel, carefully wind the chain on the fusee cone. During this procedure be sure that the chain is not kinked and is properly seated in the lead off cups. Mount and secure the front plate and reverse the previous procedure by keeping tension on the fusee and winding the chain back on the spring barrel. This positions the chain on the barrel so that the links slide easily into the lead off cups when the movement is wound. Because the verge is not in place during this entire procedure, the spring barrel and fusee assembly rotate freely. Now, maintaining enough tension on the spring barrel to keep the chain from falling out of position, secure the bridge and verge assembly to the back plate. The barrel and fusee can no longer rotate freely and the mainspring is ready to be "set-up".

**MAINSPRING SET-UP:**

Place the spring arbor retainer **B** on the spring arbor so that the machine screw mounting hole is in the six o'clock position. With the movement secured, using the T-handle key, turn the spring arbor one and one-half turns (clockwise), aligning the hole on the retainer with the threaded hole on the front plate. Insert the machine screw and tighten. Without additional tools, the procedure just outlined is probably the most simple and, in most cases, will allow the clock to run seven-eight days when fully wound. Since the barrel spring in most of these clocks is at least 30 years old, you would expect some fatigue and the possibility of the clock not running the full eight days. A.H. Gledhill required that "when the spring is set-up at its lowest position, it will exert a force of 20 lb. on the chain before the clock is wound up". If exactness is required a torque wrench can be used to measure the tension on the spring.

Final assembly can be accomplished by adding the cocks and assemblies of the cannon pinion, cam **A** and lever **C** to the front plate. To keep AM/PM synchronized with the day wheel on the printing motor, the clock hands should be at 12 o'clock, and cam **A** and lever **C** positioned so that the roller on lever **C** has just passed the largest diameter of cam **A**, allowing it to drop fully against the stop. The linkage between lever **C** and the day wheel turns enough to change the day orientation from vertical to horizontal, i.e.

FRI

After being sure that all machine screws are securely tightened, the spring can be fully wound. Again, be sure that the chain slides easily into the lead off cups. Very often before this first wind up the chain loses a little of its position on the spring barrel and it is necessary to help reposition it during the winding. The stop works mounted on the inside of the front plate will prevent overwinding. Mount the movement on its frame, attach the pendulum, put the clock in beat and allow to run until fully unwound. It should run for at least seven days. Anything less than this would indicate a fatigued spring, a shortened fusee chain or both.

## MART

The Editor would be happy to include a "Mart" in your British Horology Times. It would be a listing of items WANTED and items FOR SALE. It could also include a listing of your SERVICES if you are a craftsman. Available only to members of Chapter 159. There will be no charge for a listing.

Send listing to Doug Cowan, Editor, 110 Central Terrace, Cincinnati OH 45215

# CLOCK AND WATCH TRADE IN THE 1860s

By Drew White, Ontario

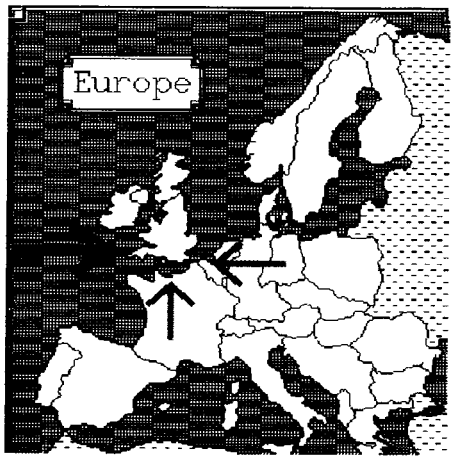
When England was at the height of its empire, free trade was a major policy iniative. While this was great news for consumers, it significantly increased the competition for England's clock and watch makers. In fact it helped encourage other countries to market their clocks and watches to the growing English population.

During the 1860s the import duty on clocks into England was NIL, while the import duty on watches was only 5%.

By contrast, the United States was very protectionist. Notwithstanding that it did not need protection for its home grown clock industry which was starting to flood the world with mass produced inexpensive and good quality clocks, it still created barriers.

The United States levied a 35% import duty on clocks and a 25% import duty on watches.

Not surprisingly the clock and watch trade into England was much higher




*See CLOCK & WATCH TRADE, page 9*

TABLE A
ENGLISH CLOCK IMPORTS, 1866[1]

| COUNTRY | NUMBER OF UNITS | DECLARED TOTAL VALUE | PRICE PER CLOCK |
|---|---|---|---|
| Holland | 39,055 | £9,523 | 5 s |
| France | 80,177 | £190,321 | £2 / 8 s |
| USA | 134,510 | £54,353 | 8 s |
| Other | 612 | £1,682 | £2 / 17 s |
| | 254,354 | £255,879 | |

[1] Source: Dictionary of Commerce & Commercial Navigation -McCulloch, 1868 edition

*CLOCK & WATCH TRADE, from page 8*

than exports.

In 1866 clocks imported into England came from the countries shown in table A.

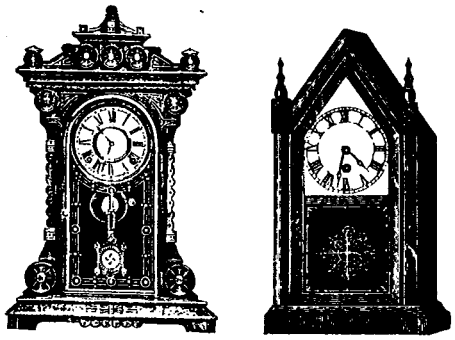
This was at a time when an English common labourer was paid about 12 shillings for a 60 hour week.

An interesting fact here is that Holland was still able to deliver clocks at a lower unit cost than the United States.

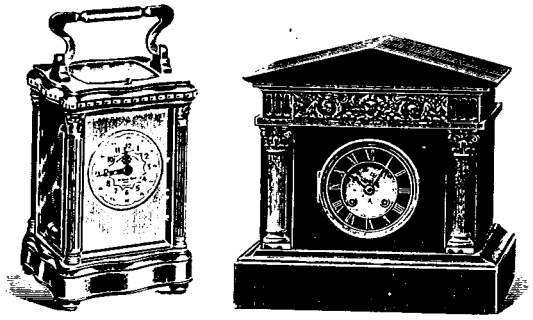
While mass production of clocks was well developed in the United States the same story could not be said for watches, and England mainly imported these from France. In 1867 England imported a total of 24,380 gold watches and 95,317 silver watches. These numbers represented a significant proportion of the total watches sold in England. In the same year of 1867 London makers made 25,437 gold watches and 98,143 silver watches for a value of about £600,000. Smaller production was also carried on at Birmingham and Chester but their combined totals were 12,507 gold watches and 30,202 silver watches.

On the other hand total exports of British made clocks and watches in the year 1867 had a total value of only £15,818.

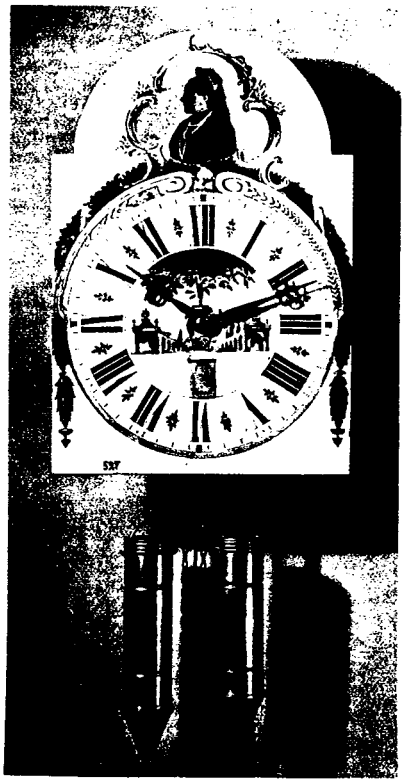
*Editor's note: It is the Editor's belief that the Holland referred to herein actually means German clocks, commonly and mistakenly called "Dutch Wags" in England. This was a perversion of the Geman word "Deutsch" meaning "German". There are very few Dutch clocks of this age found in England but lots of German Black Forest wag-on-the-wall clocks. Also Germany is very obviously missing from the table — yet was a major exporter to England.*



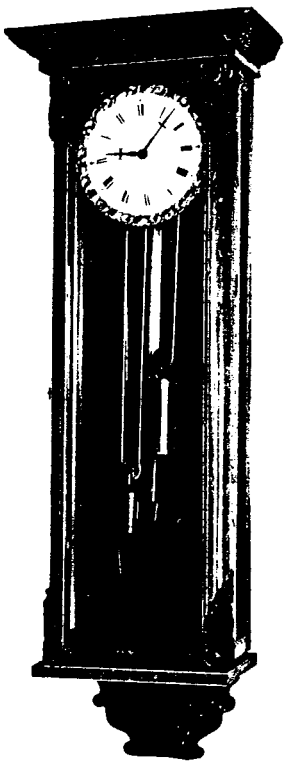
FROM THE U.S.



FROM FRANCE



FROM GERMANY

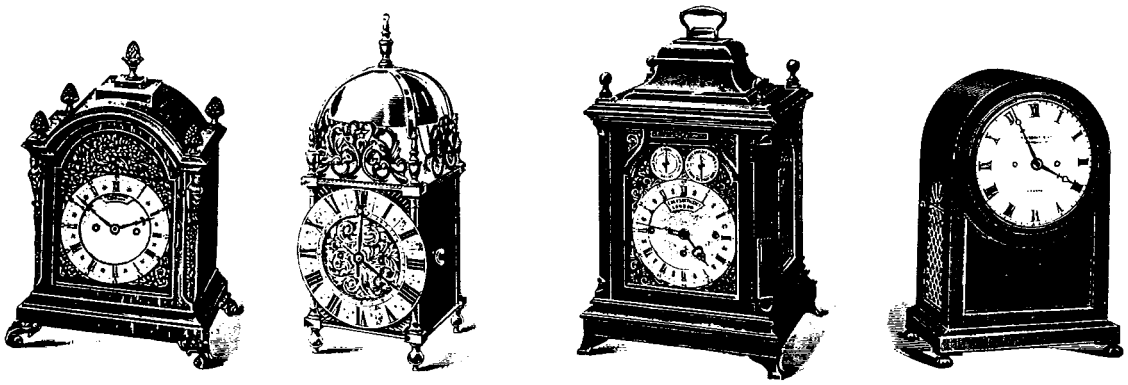


FROM AUSTRIA-HUNGARY

## TYPES OF CLOCKS IMPORTED INTO ENGLAND IN THE LAST HALF OF THE 19th CENTURY

(Meanwhile the British were not standing still... see page 10)

# TYPES OF CLOCKS BEING MADE[1] IN ENGLAND NEAR THE END OF THE 19th CENTURY



A B C D

A. Style of wood case, feet and mounts borrowed from earlier period.

B. Still being made; now described as "clock in brass lantern case". See article *English Lantern Clocks* beginning on page 1 of this issue.

C. Wood case with detailing from earlier period. Most expensive of examples shown at about £19.

D. Simple wood hump-back case.

(Drew White's article on English Clock and Watch Trade beginning on page 8 of this issue prompted Paul Odendahl to contribute the illustrations on pages 9 and 10.)

*[1] The contributor believes that these clocks, although described in catalogs as "English", actually were fitted with imported (probably German) movements.*

***LANTERN CLOCKS,** from page 5*

center. Tulips disappeared, although the dolphin frets remained. The maker's signature became bolder and was often engraved in a horizontal line instead of following the curve of the chapter ring. Very few clocks had alarm work. During the transitional period some square dial lanterns were found. These spelled the doom of lanterns because the same square dial clock in a longcase provided protection for the movement and pendulum.

Collecting lantern clocks is exciting, but the amateur can easily be fooled by forgeries. Lots of forgeries exist so one must be extremely careful when making such a major purchase. The most valuable clocks are, of course, those that are authentic with their original method of regulation.

An excellent comprehensive reference book on the subject is *English Lantern Clocks* by George White. It includes a chapter on spotting forgeries and conversions. The book is expensive (about $125) but well worth it if you plan to get into collecting.It is close to going out of print, so hurry!



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