Tick - Tock
Care for Your Clock

Connecting to Collections Care Webinar

Cathy and Greg Gorton
Gorton Clocks

January 20, 2020

Topics

Clocks and Materials

Clock Assessment

Clock Care

Should the Clock Run – Dynamic Object Concerns

When to Call a Professional

Resources

Clock Care Resources For Museum

Museum Authored Care Guides

The Henry Ford Museum Care Guides

Winterthur Collection Care Tips

The National Trust Manual of Housekeeping

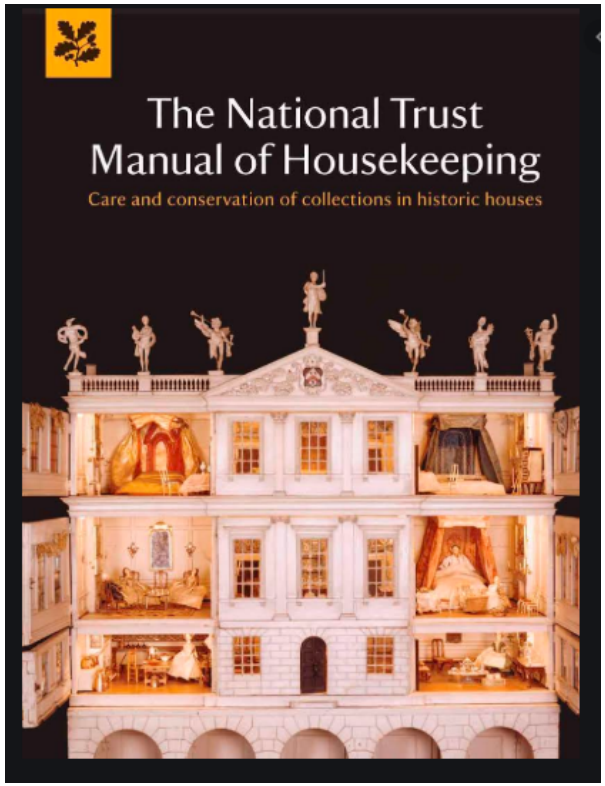
Conservation Institution

FAIC C2CC – Foundation for Advancement of Conservation – Connecting to Collections Care

AIC – American Institute of Conservation

ICON – Institute of Conservation

CCI - Canadian Conservation Institute



Clock Care Resources For Museum

Horological Associations

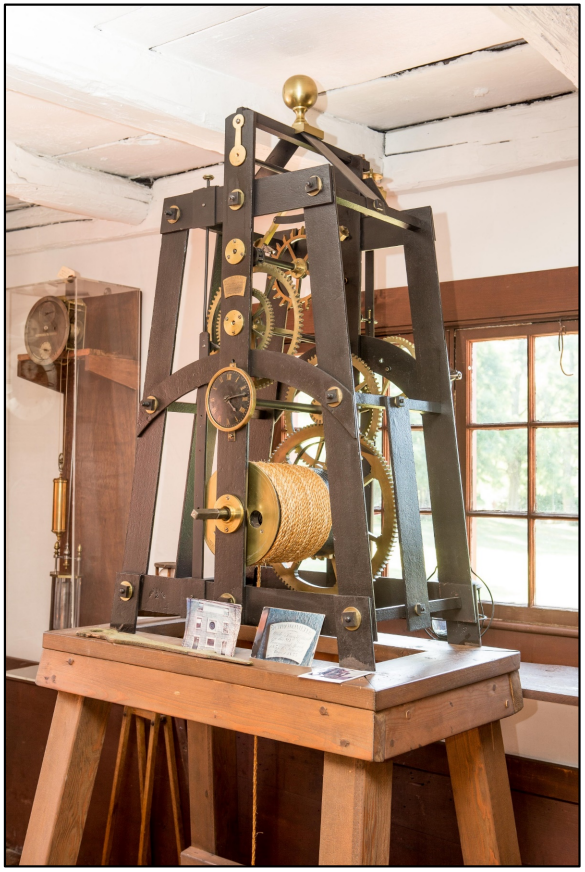
- NAWCC – National Association of Watch and Clock Collectors
- BHI – British Horological Institute
- AHS – Antiquarian Horological Society
- AWCI – American Watchmakers - Clockmakers Institute

Clock Museums

- American Clock and Watch Museum
- National Watch and Clock Museum
- Willard House and Clock Museum

Clock Types

Tall Case
Wall Clocks
Shelf Clocks
Tower Clocks



Willard House and Clock Museum

Identifying Clocks

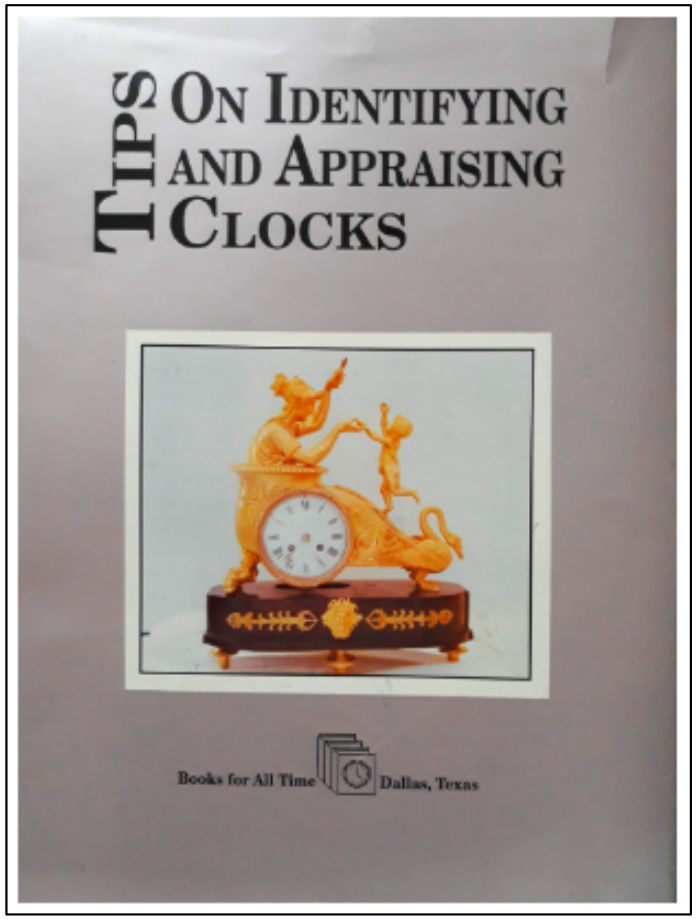
Books available on Amazon or Barnes and Noble

The Clock Book, Philip E. Balcomb, 1996

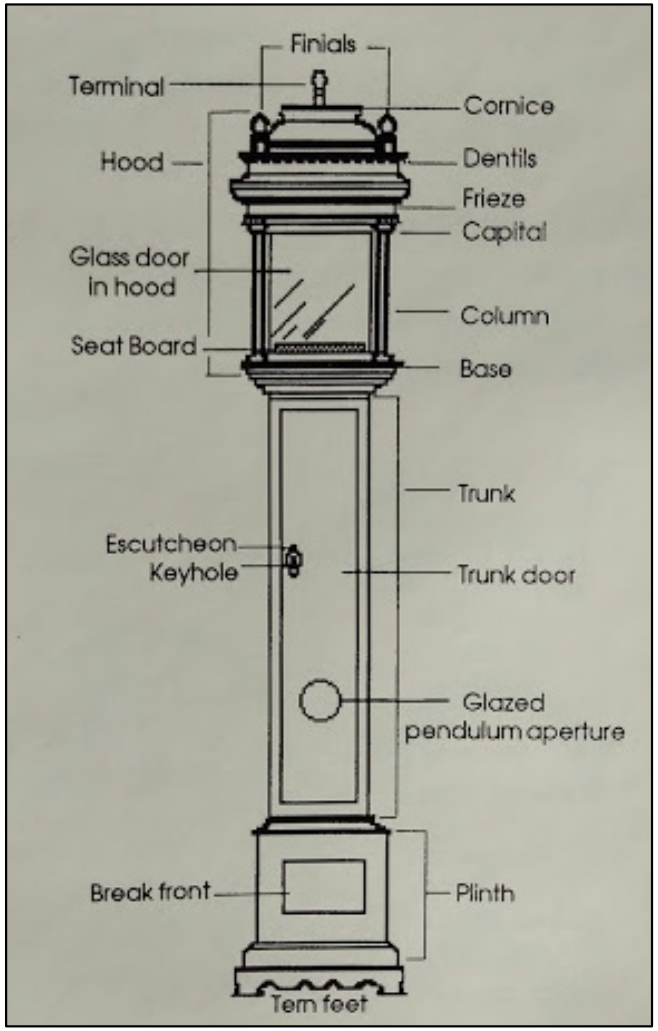
Tips on Identifying and Appraising Clocks, Martha Tips, ISA, CAPP, 1991

The Price Guide to Collecting Clocks, The Ultimate Reference to American and European Clocks, Frederick W. Korz, 2003

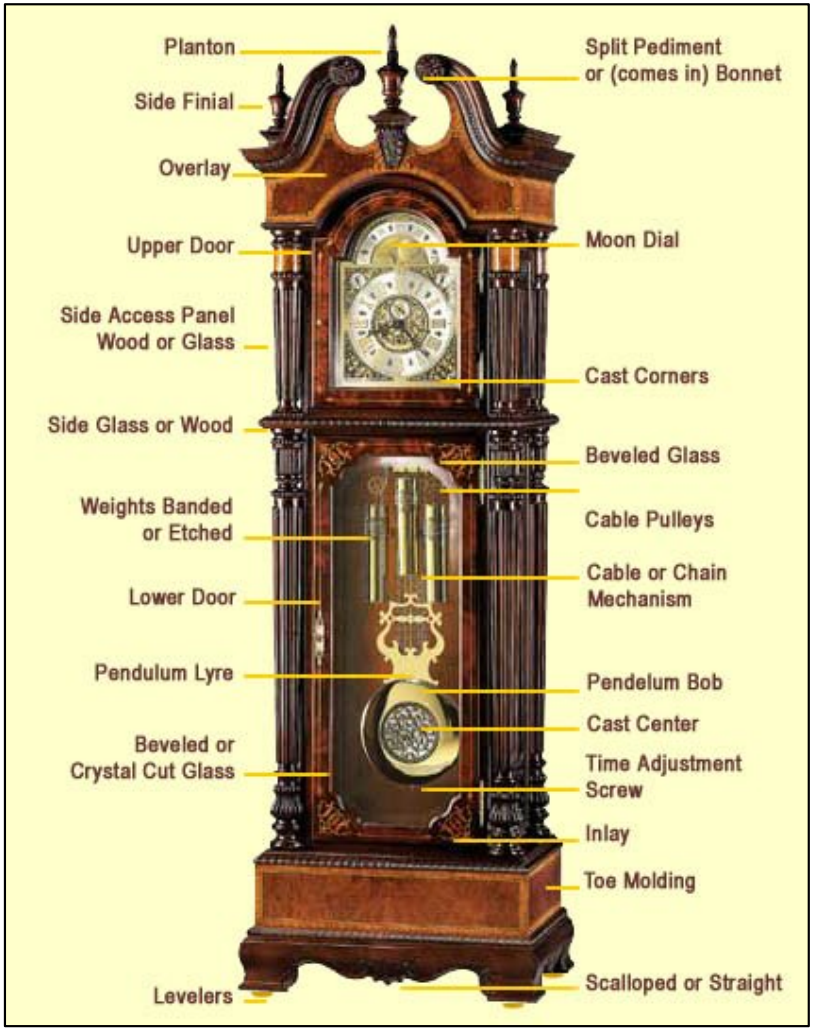
NAWCC Library at the National Museum of Watch and Clocks – Columbia, PA



Learning the Terminology



Tips on Identifying and Appraising Clocks, Tips, pg. 3



https://grandfatherclocksblog.com/key-parts-grandfather-clocks-labeled/

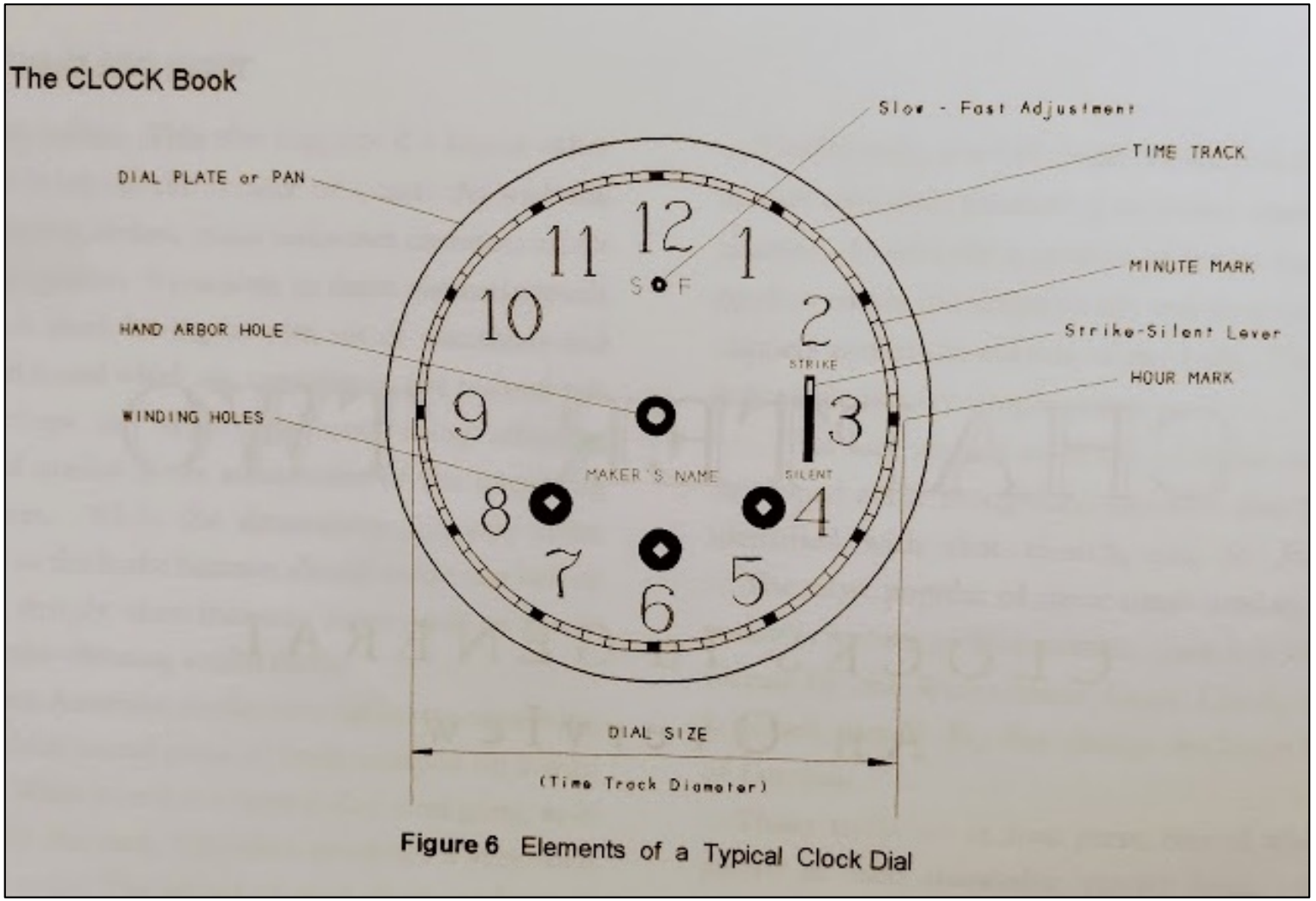


Figure 6 Elements of a Typical Clock Dial

Time Only -
(Time Piece)

Time and Strike

Time, Strike and Chime

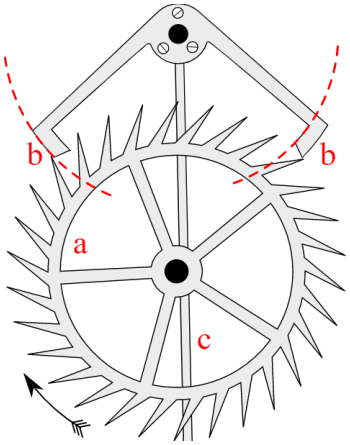
The Clock Book, Balcomb, pg. 16

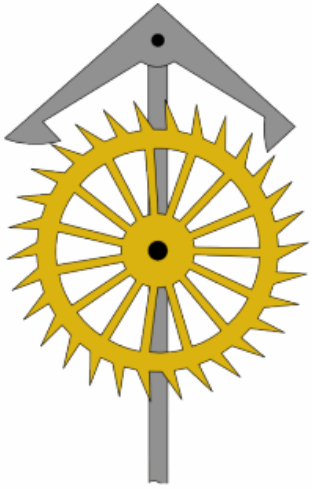
Clock Mechanism Variation

Power Source – weight, spring, water, electricity…

Oscillator – pendulum, balance wheel, torsion pendulum, foliot …

Escapement – dead beat, anchor recoil, crown and verge…





Wikipedia Escapement Images - https://en.wikipedia.org/wiki/Escapement

Cases - Materials

Metals – brass, bronze, copper, gold, silver, iron, steel, nickel, chrome, zinc alloys, pewter

Wood – pine, walnut, oak, cherry, mahogany, rosewood

Minerals – marble, alabaster, stone, slate, jade, coral

Animal – leather, ivory, bone, tortoise shell, mother of pearl

Plastics – Celluloid, Bakelite, thermo plastics

Paint – casein, milk paint, oil paint, lead paint

Other – Glass, ceramic, crystal, porcelain, papier-mâché, adamantine finish

Cases - Decorations and Finishes

- Engraving of brass elements often filled with black sealing wax
- Mouldings, carvings, finials
- Clear finishes – wax, resin, oil, shellac
- Pigmented paint finishes
- Reverse painting & stenciling on glass
- Gilding
- Textiles – silk and other fabrics

Dials and Hands - Materials

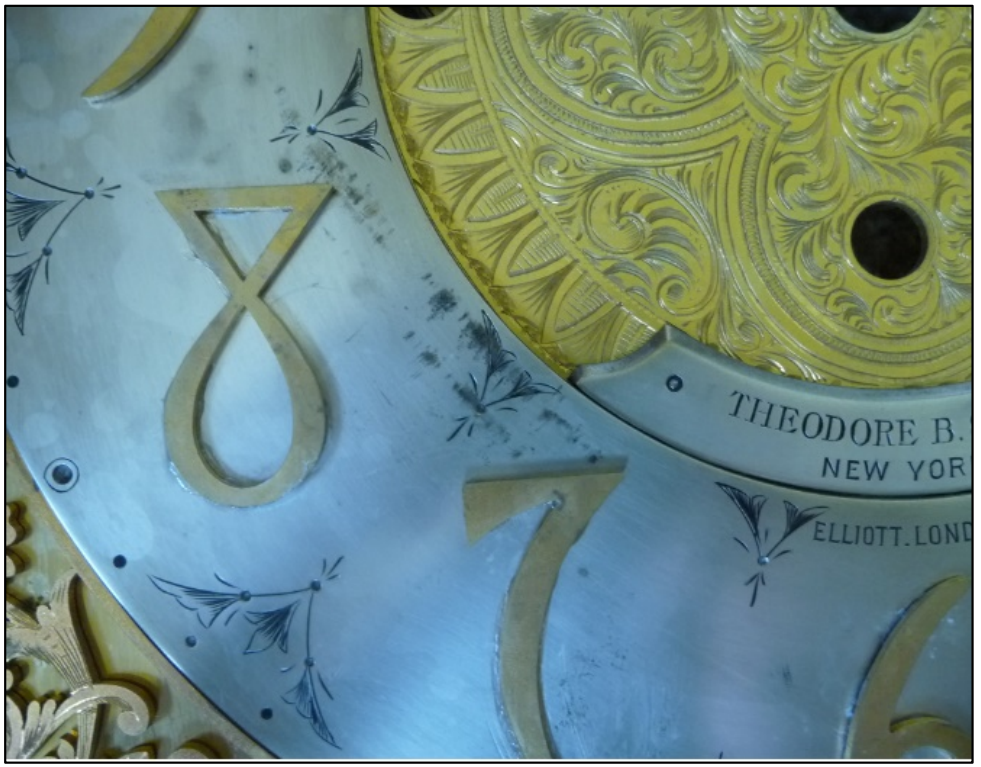
- Dial Plates – Metal, wood, porcelain
- Brass, sometimes silver plated with black enamel or shellac filling
- Painted zinc dials with embossing
- Paper
- Radium paint – hazardous material

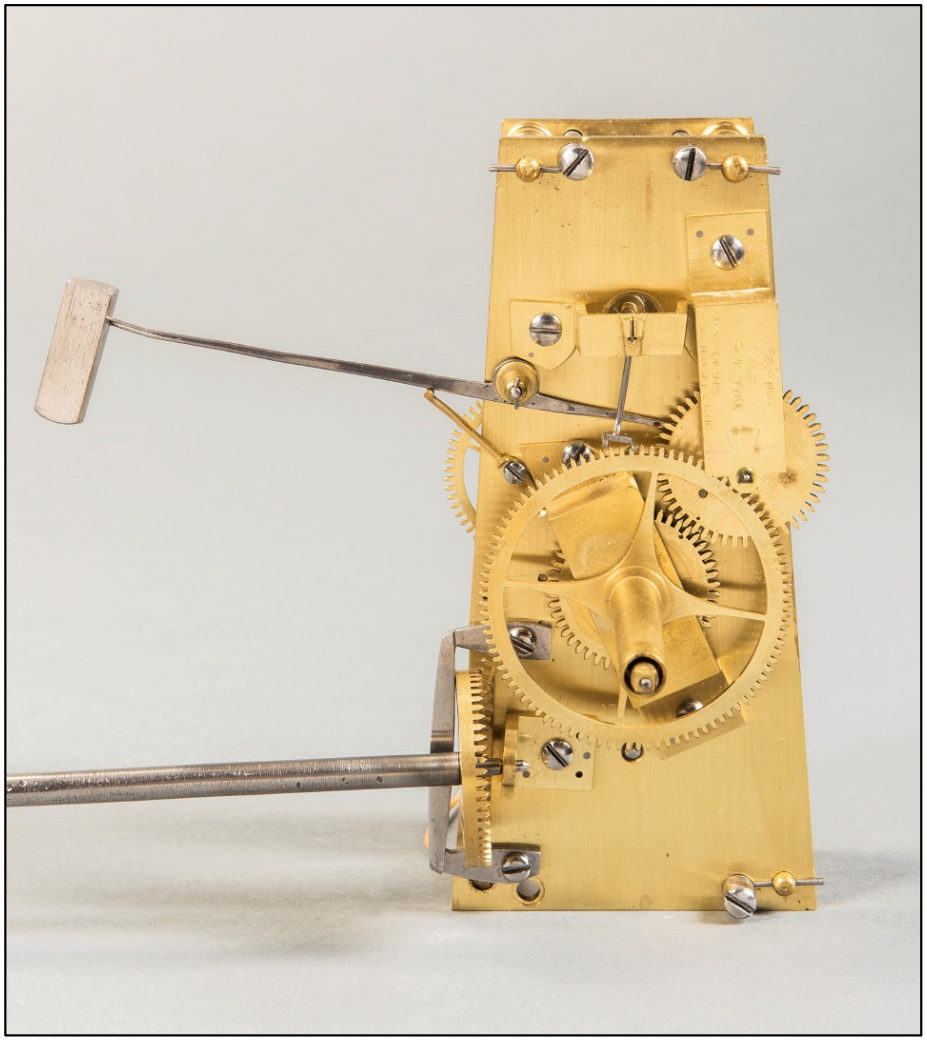
https://www.epa.gov/radtown/radioactivity-antiques

- Hands – majority are steel, wood, plastic, brass, lead, pewter

Dials and Hands - Materials

- Engraving of brass elements often filled with black wax
- Aluminum, sometimes anodized to a gold color
- Copper with porcelain faces
- Glass with printing or paint
- Cast iron or cast bronze





Willard House and Clock Museum

Clock Movements

Materials

Wood	Brass	Iron
Steel	String	Silk
Paper	Copper	Leather

Caution – Be Aware

Current international laws/restrictions if shipping abroad even on-loan.

Unexpected materials

Lead paint (Hazardous) – typically French metal clocks circa 1700s

Pigments can be hazardous, not just lead oxides. In doubt, send sample for analysis

Radium in Antiques – EPA webpage

https://www.epa.gov/radtown/radioactivity-antiques

National Watch and Clock Museum

French clock, circa 1830's with tortoise shell and ivory.

Mercury

Environmental Protection Agency

https://www.epa.gov/mercury

Use Caution!!!

Alternatives are available similar to the one shown from vendors like www.timesavers.com

Willard House and Clock Museum

Clock Assessment

Description

- Provenance
- Materials – Case, dial, movement, etc
- Dimensions

Photos

- Case (front, back, sides) and labels
- Keys, dials and hands
- Movement, weights, pendulums
- Special markings

Willard House and Clock Museum

Clock Assessment - Condition

Case Condition

- Decorative elements
- Damage
- Structural weaknesses
- Losses and surface markings

Movement Condition

- What works and doesn't work
- Corrosion
- Broken
- Worn
- Missing components

Identifying replaced parts vs. original

CLOCK OBJECT

INITIAL ASSESSMENT FORM

Inventory Number	**Clock Type**	**Signature**	**Maker**
Period of Manufacture	**Serial Number** Frame or Plate Number	**Origin**	**Clock Case Dimensions**
Movement	**Strike/Chime**	**Pendulum** **Pendulum Lock:** Yes No	**Weights**
Moon Dial: Yes No **Calendar:** Yes No **Winding Key:** Yes No **Crank Key:** Yes No **Case Key:** Yes No	**Hands**	**Dial**	**Dial Dimensions**
Additional Markings: Labels, notes		**Complications:** Alarms, musical additions, etc.	
List of Materials: Wood Brass Steel Zinc Lead Aluminum Iron Tin Pewter Gold Silver Glass Crystal Ceramic Porcelain Marble Granite Stone Paper Paint Ink Papier Mache Silk Mercury (Hazardous) Other:			

Pictures:			

Use letter codes for quick reference: **(C)**ase **(M)**ovement **(T)**ime **(ST)**rike **(STS)**rike Silent **(CH)**ime **(CHS)**ime Silent **(AL)**arm **(BR)**oken **(CO)**rrosion **(CR)**racks/splits **(D)**amage **(DI)**iscolored **(FL)**aking **(LD)**ight Damage **(L)**osses **(M)**old **(W)**eak

Case Condition: Describe condition, note decorative elements, damage, structural weakness, losses, surface markings, not original

Movement Condition: Describe condition noting what works, does not work, corrosion, broken, bushings, oil, missing, not original

Other Comments:

Assessment Performed By:	**Date:**	**Phone:** **Email**:

Developed by Gorton Clocks for the Connecting to Collections Care Webinar, January 2020. Permission granted to use and disseminate as needed.
https://www.connectingtocollections.org/care-for-clocks/

Clock Damage Risks

- Poor Environment
  - Fluctuating temperatures
  - Fluctuating humidity
  - Excessive exposure to light, pests or pollution
- Careless handling
- Unsafe display
- Improper cleaning and repair
- Over-winding

Understand and minimize or eliminate conditions that cause damage

Record of Monitoring and Plan of Care

Special Care Instructions

Environment, cleaning, inspecting & moving

Winding Instructions

- What and how to wind
- How to stabilize the case
- Key/crank location & turning direction
- Weight height
- What to listen for

Record of Monitoring And Plan of Care: Clocks

Inventory Number	Clock Type	Location	Record Period Start Date: End Date:
Brief Description of Object:			
Special Care Instructions from Conservator: Describe environmental, cleaning, inspecting, moving, etc.			
Winding Instructions: Describe how to stabilize the case, what to listen for, how high weights should go, which way to turn hands			
Winding Frequency: None Daily Weekly Monthly Annually **Other:**	**Wind these Trains:** Time: Clkws Counter CW Strike: Clkws Counter CW Chime: Clkws Counter CW	**Key/Crank Location:** **Case:** **Winding:**	**Silence These:** Strike Chime Alarm

Record of Monitoring and Plan of Care - Continued

Include picture/sketch below to clarify Care Instructions for winding, cleaning, inspecting, etc. Use letter codes as needed.
(C)ase **(M)**ovement **(T)**ime **(ST)**rike **(STS)**rike Silent **(CH)**ime **(CHS)**ime Silent **(AL)**arm
(BR)oken **(CO)**rrosion **(CR)**racks/splits **(D)**amage **(DI)**iscolored **(FL)**aking **(LD)**ight Damage **(L)**osses **(M)**old **(W)**eak

Dial	Case	Weights	Movement

Winding Record: Initial/date. Wind if necessary. Inspect. Notify conservator of new damage, unusual sounds, malfunction, etc.

Care Record: Indicate **(DU)**sted, **(WA)**xed. Initial/date. Notify conservator of new damage, unusual sounds, malfunction, etc.

Notes:

Photos Or Drawings

Record

Museum Authored Care Guides

The Henry Ford Museum Care Guides

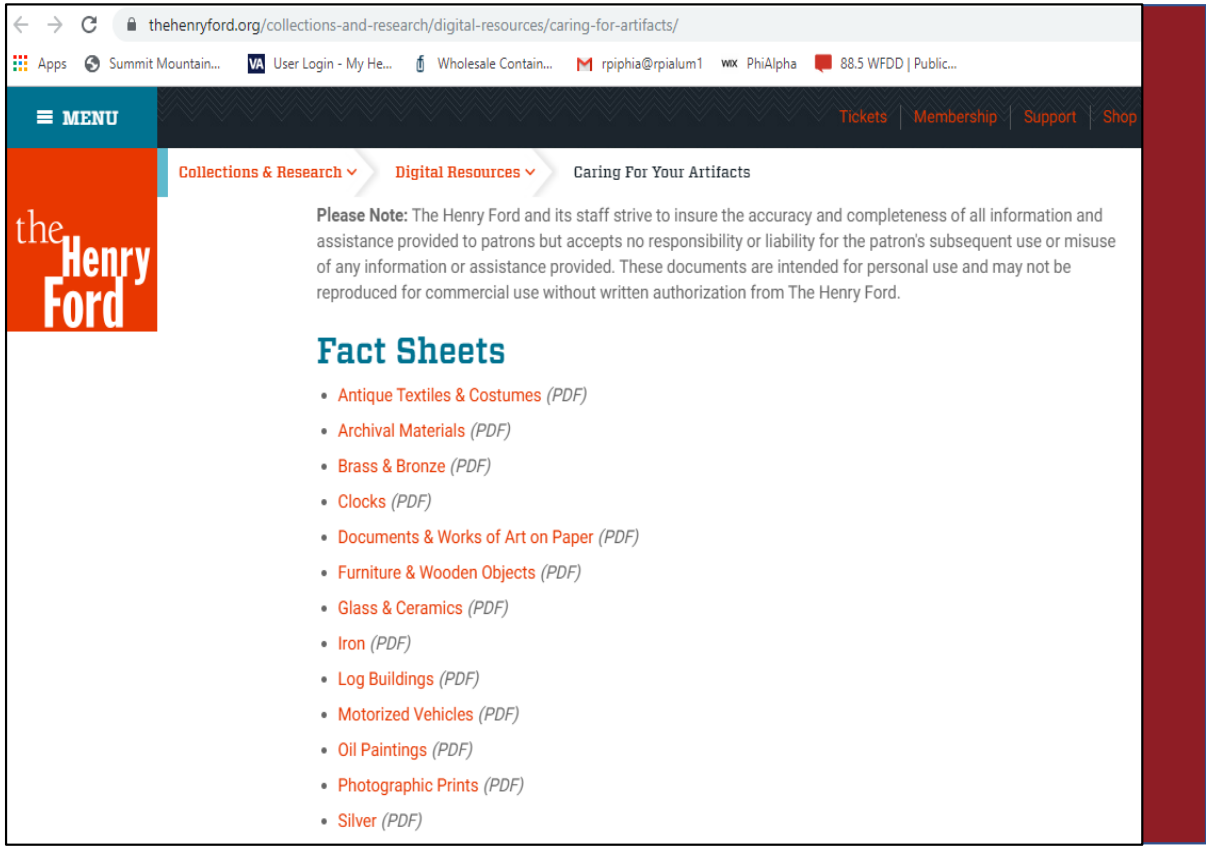
https://www.thehenryford.org/collections-and-research/digital-resources/caring-for-artifacts/

- Clocks
- Brass & Bronze
- Documents & Works of Art on Paper
- Furniture & Wooden Objects
- Glass & Ceramics
- Iron
- Silver

Winterthur Collection Care Tips

http://www.winterthur.org/collections/collection-care-conservation/collection-care-tips/

The National Trust Manual of Housekeeping, Chapter 29 - Clocks, Jonathan Betts, Pages 330 – 343



Caring for Clocks – Cleaning & Inspection

Cases

Know your materials and care for accordingly.

Ex: Wood cases: Dust and wax as necessary

Avoid cleaning with cloth – snags on veneer, and delicate and intricate pieces

Avoid sprays with alcohol, silicon

Inspect routinely for pest and other damage

The Henry Ford Museum Care Guides

Caring for Clocks – Cleaning & Inspection

Movements

Should be inspected, cleaned and oiled by a professional once every 5-10 years

Inspections include looking for broken or worn parts, corrosion, accumulation of dirt or oil.

Note if clock runs irregularly or not for full duration. Call a clock professional.

Environment – Stable Temperature and Relative Humidity

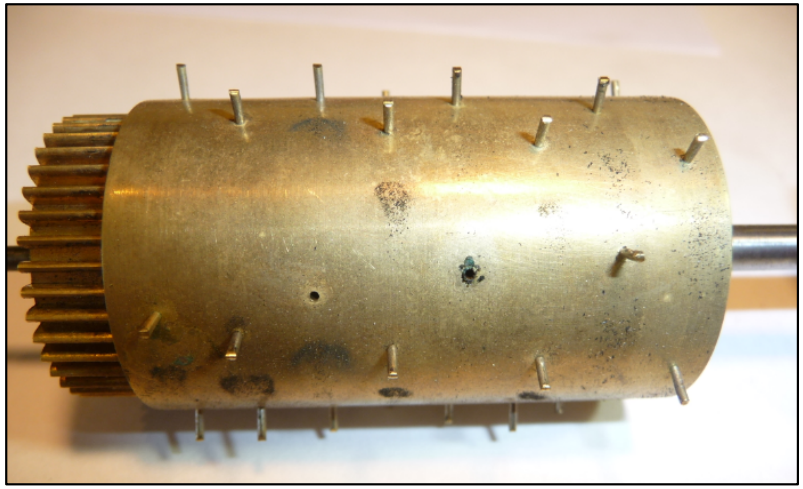
Recommendations

	Winter	Summer
Temp:	70° F	70° - 75° F
Rh:	35% - 50%	40% - 60%

Wood cases and clocks constructed of various materials

Metals - 68° F and 30% Rh

The Care and Preservation of Clocks, Mary M. Fahey, Chief Conservator The Henry Ford, https://www.thehenryford.org/docs/default-source/default-document-library/the-henry-ford-clocks-conservation.pdf?sfvrsn=2



National Parks Service: 60° - 75° F and less than 35% Rh for most metals

NPS, Appendix O, Curatorial Care of Metal Objects, https://www.nps.gov/museum/publications/MHI/Appendix%20O.pdf

Environment – Lighting

Limit Light

Levels (foot-candles or lux)
Types (visible or ultraviolet)
Length of exposure

To Minimize

Aging of finishes
Color changes of stains and paints of paper and textiles

Avoid heat generated from light sources. Finishes may become soft, sticky and easily damaged by dirt.

The Care and Preservation of Clocks, Mary M. Fahey, Chief Conservator The Henry Ford, https://www.thehenryford.org/docs/default-source/default-document-library/the-henry-ford-clocks-conservation.pdf?sfvrsn=2

Pest Damage

Carpet Beetles – prefer adhesives generally found at joinery and inside clock cases. Look for tiny black beetles (2mm), small worms or furry carcasses.

Powder Post Beetles – bore small holes (2mm) in wood

What to Do

Examine items routinely for infestation

Inspect underside of legs and inside case. Insects hide in inconspicuous, dark places

IF infestation is found

Isolate object in plastic bag

Call a professional Conservator

Resource: "The Guide to Museum Pest Control", By Zycherman and Schrock

The Care and Preservation of Clocks, Mary M. Fahey, Chief Conservator The Henry Ford, https://www.thehenryford.org/docs/default-source/default-document-library/the-henry-ford-clocks-conservation.pdf?sfvrsn=2

Mold Damage

Wear Personal Protective Equipment
Identify and Assess
Develop a Plan
Isolate
Clean

FAIC Video, Mold,

Resources:

- **Mold In Collections,** National Heritage Responders, FAIC, https://www.culturalheritage.org/docs/default-source/resources/emergency-resources/tips-sheets/mold.pdf?sfvrsn=4
- **Mold –** YouTube Video – 8 minutes, 2006 Heritage Preservation, Inc https://www.youtube.com/watch?v=5nbAa0ekcXM

Safe Clock Handling

Remove objects that can scratch surfaces

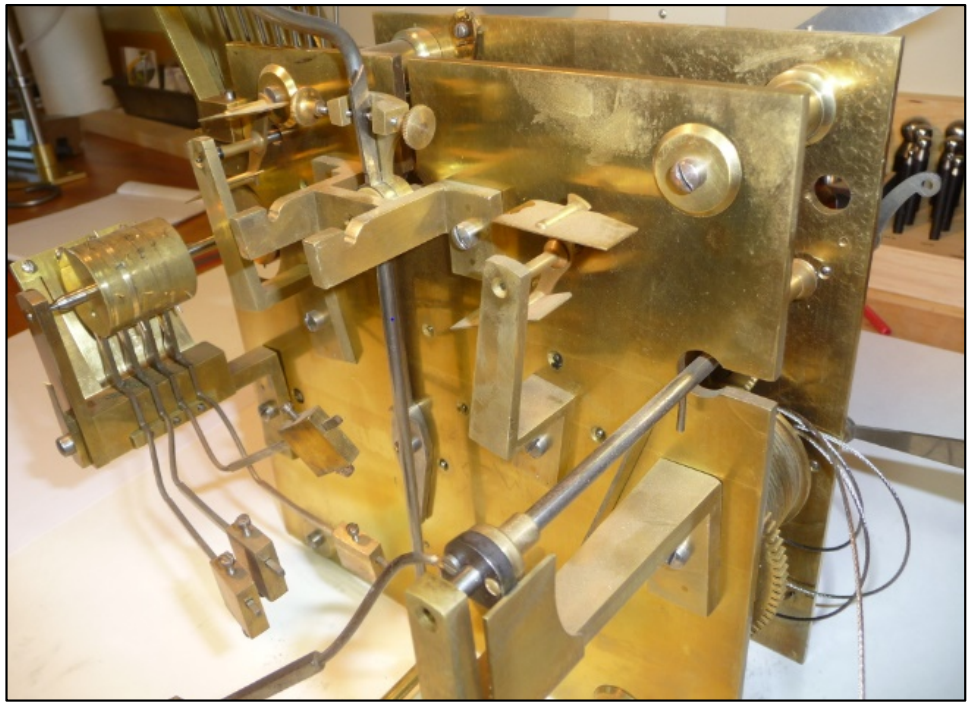
- Belt buckles
- Jewelry – Rings, bracelet, watch, necklace
- Keys
- Chains

Avoid touching metal surfaces with bare hands

- Oils and salts from hands can lead to corrosion
- Wear vinyl gloves (no talc), especially when handling metal portions of the clock

Risks in Handling and Moving Clocks

- Don’t lift a clock by its handle
  - It may pull away from the case
- Unsecured doors can open
- Decorative elements can break
- Unsecured pendulum and weight can damage the case
- Pendulum bobs with mercury DO exist
  - Use Extreme Caution!!!



Safe Handling - Considerations

Size and weight of Clock
- Number of people to safely move

Condition of Clock
- Fragile or compromised case, decorative elements, moving clock parts

Materials to safely move
- Dolly, blankets, padding, cart, etc.

Route Obstacles
- Thresholds, ceilings, stairs, floor coverings, other objects

Final Destination Preparation

Moving a Clock – Safe Handling DOs…

Remove case elements and move separately

- Finials
- Hood of Clock
- Decorative Elements

Determine whether to **unwind mechanism**

Secure or remove the **pendulum**

Secure the **escapement (spring driven)**

Secure or remove **weights**

Secure or remove **bells**, **rods, tubes** and/or **gong** (if necessary)

Secure all **doors**

Moving a Clock – DO…

Know how heavy the clock is

Decide how many people are necessary to move the clock

Secure or Remove necessary clock case and movement parts

Decide where to hold the clock to lift and move

Create a clear movement route

Know where the obstacles are in the path, ex. door frame height, steps, protruding objects…

Ensure final destination prepared for clock

Institution Clock Moving Notes

Biltmore

ALL Clocks have metal components, so gloves should be worn with them at all times.

If the clock is to be moved to another room, it should be placed on a cart to move it.

- Clock is **very heavy**, requires at least 2 people to move.
- Check thoroughly for loose parts before moving it.
- Be very careful not to jerk or tilt.
- Front door opens, hinge is loose.
- Secure door.
- Clock has very small feet and is somewhat top heavy.
- Rear door latches well, turnkey clicks when engaging.
- Lift up carefully, watch foot placement when setting down.

Institution Clock Moving Notes

- 4 Person move - need 2 tall ladders and 2 people on the floor to receive parts.
- Bonnet (hood of clock) must be removed for any movement. Bonnet slides forward for removal.
- Weights have been removed.
- Don’t touch any painted areas or metal parts.
- Pendulum has NOT been removed from this clock, it is secured inside.
- Please contact conservation for any movement.

Biltmore

Moving Tall Case Clock – Video

Winterthur Museum Care in Handling: Handling and Moving Tall Case Clocks, (2016)

https://www.youtube.com/watch?v=7_vl6mMAReg

21 min video

Displaying a Clock

Shelf – Level sturdy surface.

Wall – Often a single mounting bracket (verify solid)

- Hang level on secure hardware
- If possible second mounting point
- Stabilize as necessary

Tall Case – Level, hard surface.

- Stabilize & secure near top

Willard House and Clock Museum

Clock Museum Display Exhibits

Three-dimensional walk around showing variety of clock displays

National Watch and Clock Museum, Columbia, PA

Clock Museum Display Exhibits

Three minute video of the American Clock and Watch Museum

https://www.clockandwatchmuseum.org/

Should the Clock Run?

YES

Dynamic object exhibit

Watch it move

Hear the beautiful sound

Multi-sensory experience

Knowledge and resources to care and maintain

NO

Condition of clock is not functional

Wear and tear on mechanical parts

Clock Professional to service the movement

Damage risk increases every time clock is handled during winding

Case-by-Case!

Who decides?

Winding the Clock

Wind clock at same time of week or day (30 hour clocks)

Ensure clear access to winding arbors (Hands not-in-the-way)

Stabilize clock with one hand

Know which way to turn key/crank

Correct direction creates clicking sound

Know how high to wind weights

Springs wound until stops

Setting the Time

Wear gloves – most likely touching metal.

Move only the minute hand clockwise.

Try not to touch the dial when moving the hand.

Careful when minute hand is passing by the hour, second hand or other dial elements.

Wait for strike and chime to complete.

If 24 hour cycle know if AM or PM.

Sometimes easier to wait and restart clock.

Setting the Time with Strike or Chimes

Listen for the preparatory sound of the movement before it strikes/chimes.

Stop moving hand as clock strikes/chimes.

Move minute hand again after completion of strike/chime.

Repeat until correct time is set.

Do Not move the hands backwards

Sample Clock Winding Notes

English Bracket Clock

Wind the time arbor 7 revolutions each time it is wound.

The clock should be wound once a week.

If the calendar is off, wait until noon to change it because it changes naturally very late. Use a small pencil eraser to move the date wheel.

Sample Clock Notes

Library Clock

Wind each arbor 12 revolutions clockwise.

When moving the clock, you must remove the bell first, then the pendulum.

Image from Anthony Gray Clocks website

Sample - Clock Winding Notes

Clock in Cabinet

Only pull the rope down; don't lift the other up at the same time.

Wind the weight up only until it reaches the top of the open window.

To slow the clock down, turn the screw on the bottom of the pendulum to the left; one revolution equals about one minute in 24 hours.

Biltmore

Putting the Clock In-Beat

In-Beat - Even: Tick – Tock – Tick – Tock

Not in Beat - Uneven: Tick-Tock -----Tick-Tock

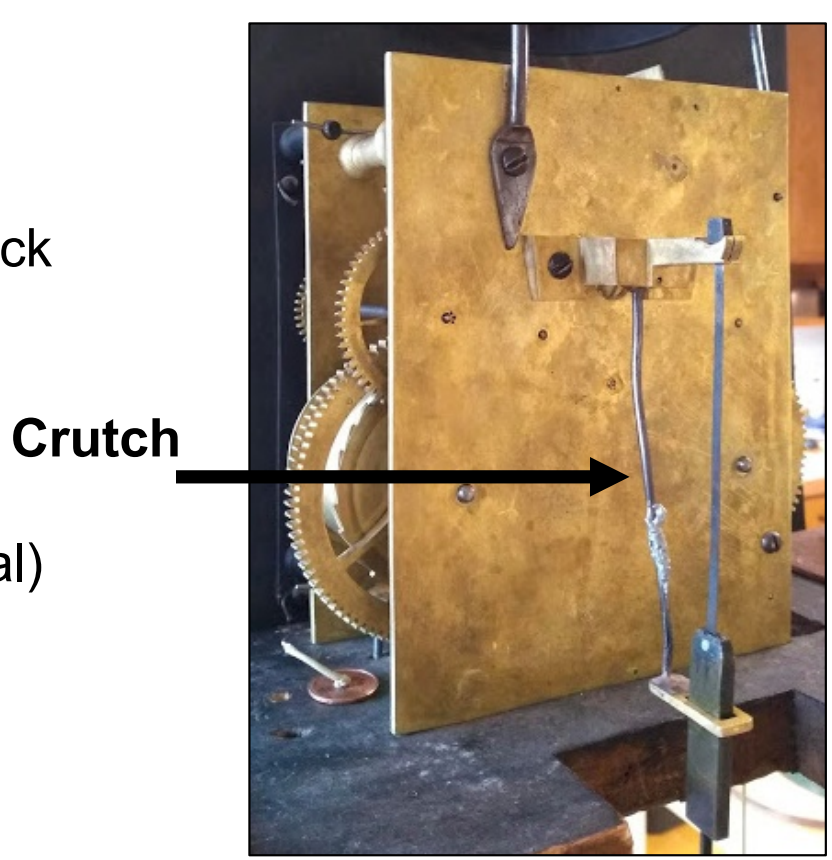
Level the clock

Adjust leveling to achieve even beat

Place shim under a side

Bend the crutch (Consult a clock professional)

Some clocks have beat adjusters



Putting the Clock In-Beat

NAWCC Video

[Chapter 15 - Putting the Clock in Beat]

2 min 27 sec video

Adjusting the Time – What to do

Running Slow

Want to **speed up** the pendulum by making it **shorter**.

Turn bottom nut to **raise** bob.

Running Fast

Want to **slow down** the pendulum by making it **longer**.

Turn bottom nut to **lower** bob.

Some Clocks have a S – F (Slow – Fast) adjustment on the dial.

Clock Care Dos and Don’ts

DO

Create stable environment

Wear gloves when handling

Get to know the object

Clean and inspect routinely

Handle with care

Make level and secure

Pay attention to moving parts

Pay attention to decorative and delicate elements

DON’T

Oil the clock without proper tools and knowledge

Wear jewelry or accessories that can damage a clock when handling

Lift a clock by its handle

Turn the minute hand backwards

Synchronize chimes and strikes without proper training

Move the clock without securing pendulum and weights

When to Call a Professional

To complete an assessment of the clock

To provide recommendations for a Record of Monitoring and Plan of Care

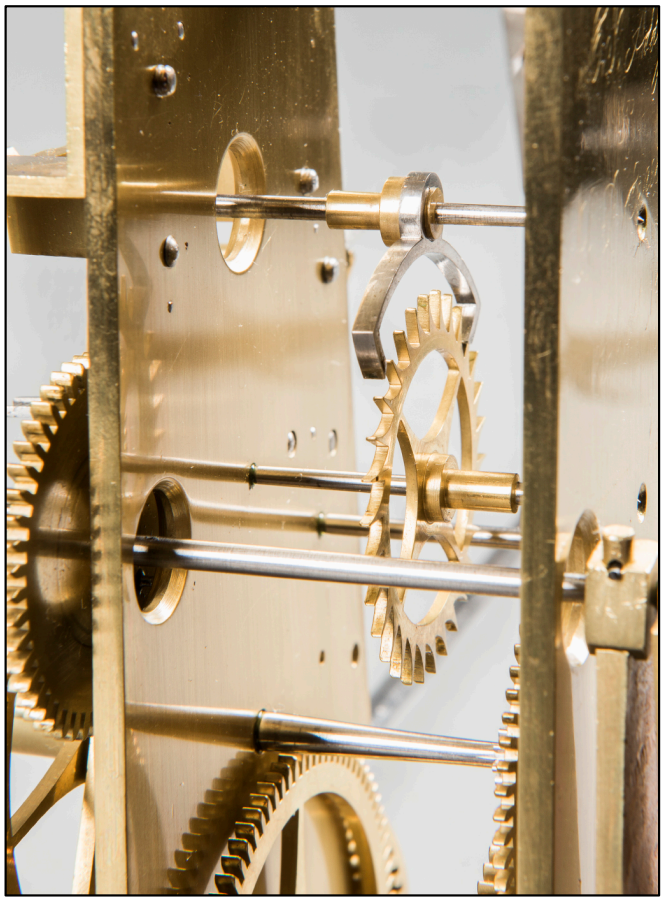
If the clock won't run or runs erratically

If uncertain about moving a clock

For repairs to the case

When in doubt…Case or Movement

Call a clock professional



Willard House and Clock Museum

Where to find a Clock Professional

Clock repair professionals are not required to have a certification

The AWCI and the BHI offer clock certification

Personal referrals

Ask other museums who they use

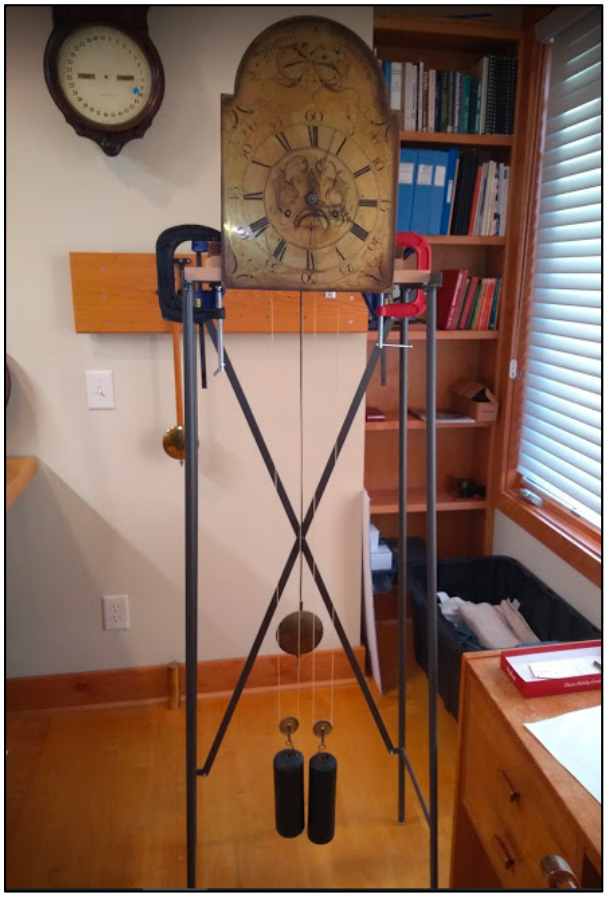
Check with reputable antique clock dealers or auction houses

Contact a local NAWCC Chapter

NAWCC webpage Clock Business Search

Agreed to NAWCC Code of Ethics

AIC Find a Conservator – Advanced search, select objects, click on search, then select subspecialty clocks/watches



Acknowledgments

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Robert C. Cheney, Executive Director and Curator, Willard House and Clock Museum

Nancie Ravenel, Objects Conservator, Shelburne Museum

Howard Cohen, Board Member, American Watch and Clock Museum

Patti Philippon, Executive Director, American Clock and Watch Museum

Meghan Kennedy, Museum Registrar, National Watch and Clock Museum

Malcolm Archer, Clocks Programme Tutor, West Dean College of Arts and Conservation

Acknowledgments

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American Institute of Conservation (AIC)

Foundation for the American Institute of Conservation (FAIC)

Institute of Conservation (ICON)

Canadian Conservation Institute (CCI)

The Henry Ford

The National Trust

Winterthur

National Parks Service (NPS)

National Association of Watch and Clock Collectors (NAWCC)

British Horological Institute (BHI)

Antiquarian Horological Society (AHS)

American Watchmakers - Clockmakers Institute (AWCI)

Questions

Willard House and Clock Museum