# CARE AND FEEDING OF YOUR EARLY AMERICAN CLOCK

By
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## A BRIEF HISTORY OF AMERICAN CLOCK MAKING

The history of timekeeping devices is almost as old as time itself but it was not until about 1658 that the pendulum was introduced as part of the controlling mechanism. Although the name of the inventor is disputed, this improvement revolutionized the construction and accuracy of clocks.

During the American colonial period, most clocks were imported from England or France and only the wealthy could afford one. By the mid 18th century numerous American clockmakers were making small numbers of tall case, or "grandfather" clocks. Brass and other materials commonly used in clock making were heavily taxed or just not available in the colonies, so these early clocks were generally made almost entirely of wood and powered by iron weights.

Smaller shelf clocks with 1-day (30 hour) wooden movements were produced in fairly large quantities from around 1810 to 1845, after which most clock makers changed over to brass movements. By 1860 iron weights were being replaced by springs as the power source, and smaller clocks, many of them 8-day, were becoming increasingly popular.

The last quarter of the 19th century saw many small clock making companies go out of business or be taken over by larger companies. By the year 1900 the vast majority of American clocks were being made by just over a half dozen huge companies. By the 1930s electric clocks had rapidly begun to replace mechanical clocks.

## CAN AN OLD CLOCK REALLY KEEP GOOD TIME?

In order to answer that question one must first consider what is "good time". The average person living in the 18th or 19th century had little need to know precisely the time of day. Work began at sunup and ended at sundown. People went to church on Sunday morning and stayed all day. There were no cars, planes, radios, televisions, or other modern-day inconveniences demanding adherence to a precise time schedule. So to a person living in the mid 19th century, a clock that was accurate to within a few minutes per week might be considered an excellent timekeeper. Extremely accurate (and costly) precision clocks were available for astronomers, scientists, and others who had need of very accurate clocks, but for common domestic clocks, the emphasis was more on low cost than absolute accuracy.

Generally speaking, a typical spring wound domestic shelf or mantel clock should be accurate to within 5 minutes or better per week. Weight driven clocks should be accurate to within 2 minutes or better per week. Older wooden works clocks are just as accurate, and often more accurate, than their newer brass counterparts.

## THINGS THAT CAN AFFECT A CLOCKS TIMEKEEPING ACCURACY

(1) **Mechanical condition**: Friction is the clock's number one enemy. Worn or poorly fitted parts, pivots (bearings) and springs that lack oil or have an accumulation of dried up oil and dirt cause friction that can interfere with a

clocks normal operation. Loose or slipping internal parts can also cause poor time keeping.

(2) **Temperature:** The materials from which a clock is made expand when they get warm and contract when they get cool. This expansion and contraction can cause the pendulum length, and the clock's rate, to change. Better clocks are temperature compensated but most common clocks are not. Variations in temperature should be avoided as much as possible. The clock should be kept out of direct sunlight, which can cause a considerable increase in temperature.

(3) **Type of power:** Weights provide a constant force throughout the run period and are an ideal power source for a clock where space permits. Springs tend to provide too much power right after being wound, and sometimes not enough power when the spring is almost "run down". Many spring-powered clocks tend to run fast after being wound and gradually slow down between windings.

(4) **Clock design:** Some clocks just seem to keep better time than others. Some have special design features such as fusees to control power delivery from the springs, temperature compensation, deadbeat escapements, and "stop work" and "provide power" mechanisms to limit how tight a spring can be wound and to keep the clock running while it's being wound. (The pendulum continues to swing but without a "provide power" the clock actually stops moving the hands while the winder is being turned.)

(5) **Placement and beat:** In order for the clock to run properly it must be "in beat". A clock that is in beat will have an even tic….tock….tic….tock sound with even spacing between the "tics" and "tocks". If the clock was properly adjusted by a clockmaker, then it will only be in beat when resting on a level surface. A number of things can cause a clock to go out of beat and require adjustment (see more about setting the beat later in this article).

(6) **Improper setting**: One usually does not think of setting the clock as a reason for poor time keeping, but unless proper procedure is followed an often-undetected error can be introduced. This typically is the case when a clock is set to the correct time then a little later found to be a minute or two slow but loses no more time for the rest of the week. This can be due to the free play or backlash in the gears that move the hands, and sometimes looseness of the minute hand on the clock shaft. (see more about setting your clock later in this article)

(7) **Adjustments and regulation**: Regulation is a user adjustment that simply sets the clock's rate. It usually involves adjusting the effective length of the pendulum to make the clock run faster or slower as required. There are several other adjustments related to the "escapement" (the part that goes tic-tock), which should only be changed by someone who understands how that particular escapement works. In addition to regulating the clock's rate, the escapement also gives the pendulum a

little push on each swing to keep it going. An escapement that is not properly adjusted, or badly worn, can cause a clock to run erratically, stop unexpectedly, or refuse to run altogether.

(8) **Tired springs:** A condition that can affect spring-powered clocks is "tired springs". After many years of use springs sometimes become "set" and loose their strength and ability to completely unwind. An 8-day clock that runs fine right after being wound but slows excessively or stops after 6 or 7 days may have tired springs. Replacement springs are available for most American made clocks but many collectors, desiring to keep their clock as original as possible, will simply wind the clock more often and keep the original springs.

(9) **Incorrect weights:** Weight driven clocks are often found with the wrong size weights installed. This is especially true of clocks bought on e-Bay and in junk shops that do not specialize in clocks. Weights are not permanently attached and are often lost during moving. Some sellers will put just any available weights with an old clock in order to make a sale.

It's not uncommon to find that a heavier weight has been used in an effort to make a badly worn clock run without making the needed repairs. Some clockmakers specify different size weights for the time and strike sides of their clocks. One should always use the correct size weight(s).

Generally, 1-day brass movements require weights of about 2 to 3 lbs. 1-day wooden movements require about 3 to 4 lbs., and 8-day shelf clock movements need about 7 to 8 lbs. Some tall case (grandfather) clocks may require even larger weights. Too little weight can cause the clock to stop, run erratically, or strike slowly. Too much weight can cause excessive wear, rapid striking, or serious damage. One should generally use the smallest weight that gives reliable operation.

(10) **Previous repairs & alterations:** It is not uncommon to find an old clock that has been improperly "repaired" or one that has incorrect parts. The possibilities are too many and varied to list here, but needless to say, a clock with incorrect parts cannot be expected to run properly.

(11) **Alignment of the stars, poltergeists, and other strange phenomenon:** Old clocks definitely have unique personalities and at times seem to have minds of their own. I know of no documented cases of clocks being haunted or demon possessed, but reports of unexplained and coincidental "clock events" are common. I have one clock that gets jealous and acts up every time I bring home another clock. I have a good friend who has a tall case clock that stopped at the exact time when it's previous owner died. Just a tall tail……maybe, then maybe not!

## MAINTAINING YOUR ANTIQUE CLOCK

Like most mechanical devices, antique clocks require periodic service. Three main things happen to clocks as they continue to run year after year; dust and dirt build up

inside the clock, oil dries up and/or becomes contaminated with dirt and turns to goo, and moving parts in contact with one another wear. Routine maintenance should periodically include complete disassembly of the clock movement, a thorough cleaning, checking for and replacing any badly worn parts, and proper lubrication. There is no absolute timetable for how often a clock should be cleaned and/or oiled. The clock manufacturer's recommendation should be followed when available. Environmental conditions, the design of the clock, and the type of oil last used should all be considered. Experienced clock repairpersons frequently are in disagreement on this topic.

My recommendation for most old American clocks is that if the clock is in unknown condition, obviously dirty, or has gone for an extended period without maintenance, then the movement should be completely disassembled, cleaned, and serviced before being oiled. After this initial cleaning and service, it may be checked and oiled again about every 1 to 5 years as needed, followed by a complete disassembly and cleaning once every 5 to 10 years. Over oiling only serves to make a mess in the case and turn the clock into a dust magnet. If after a few years, inspection reveals that the clock is still clean and the pivots well oiled, then the maintenance interval may be extended. If the clock is excessively dirty and lacking lubrication, then the maintenance interval should be shortened. When a clock begins loosing time or fails to run from one winding to the next without stopping, it may be overdue for maintenance. A dirty clock movement should always be cleaned before being oiled.

Proper oiling usually requires removing the movement from the clock, which should only be attempted by a qualified clock repairperson. Clocks should be lubricated with oils and lubricants intended for clocks. Never use WD-40 or other household or automotive products to oil your clock. Clocks with all wooden movements are not oiled except where they may have brass pivot holes or brass bushings

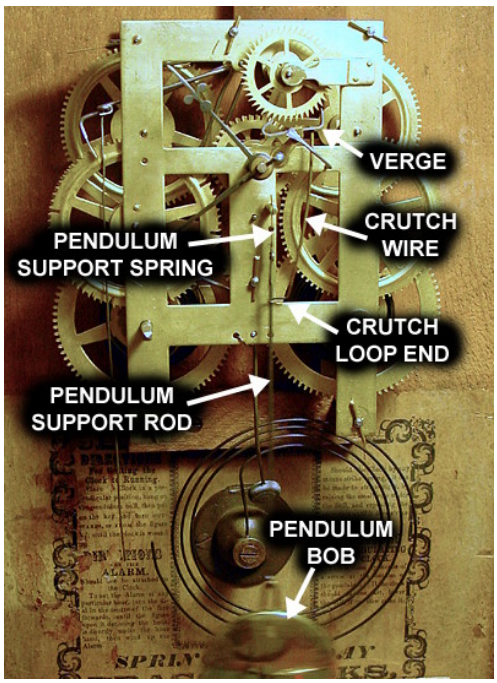
Many do-it-yourself clock repairers (and some repair shops) go to extreme lengths to avoid taking a clock apart for cleaning. Such measures may result in a clock that looks clean; it may even run ok for a period, but experienced clockmakers all agree that a clock movement cannot be properly cleaned and inspected without taking it apart. One would be well advised to either learn how to properly perform these tasks, or to establish a relationship with a reputable clock repair shop.

**What about ultrasonic and chemical cleaning?** Many clock shops use ultrasonic cleaners and may even use this as a selling point, however, the primary reason for using such devices is to allow more clocks to be cleaned in less time. The use of an ultrasonic cleaning process does NOT eliminate the need for disassembling the movement. A clock can be properly cleaned without using ultrasonic cleaning methods or ammoniated cleaning solutions

Ammonia, or cleaning solutions containing ammonia, are often used to brighten the brass parts of a clock movement, however, brightening the brass is purely cosmetic and not necessary in order to have a good running clock. Brass parts brightened this way will just turn dark again with time.

The use of ultrasonic cleaning and ammoniated cleaning solutions is widely accepted in the clock repair industry, and if used properly, probably poses minimal risk to most ordinary American clocks. However, If one is having an extremely rare and valuable "museum quality" clock cleaned, one might do well to avoid ultrasonic cleaning with ammoniated chemical cleaners. Some professionals believe that exposure to high intensity ultrasonic sound waves could potentially damage the small metal parts in old clocks. Ammonia has also been linked to a kind of metal weakening and damage called *stress crack corrosion.* Any reputable clock repairperson should be willing to discuss the

methods that he or she uses and to help the customer make an informed decision about the work to be done.




## CHECKING AND SETTING YOUR CLOCK'S "BEAT"

Setting the beat ensures that the "tics" and "tocks" are evenly spaced. A clock that is not "in beat" may run erratically, frequently stop for no apparent reason, or refuse to run all together. Although many collectors learn to make this adjustment, the actual procedure is a bit tricky and is often referred to a qualified repairperson. The procedure described here only applies to pendulum-regulated clocks. Balance wheel clocks suspected of being out of beat need to be taken to a professional clock repairperson.

Begin by listening to the clocks "**tic….tock….tic….tock….tic….tock**" sound. Then gently raise one side of the clock just a little and listen for any change in the rhythm, then raise the opposite side just a little. The clock is out of beat when the sound is like "**tic..tock…….tic..tock…….tic..tock**", or "**tic…….tock..tic…….toc..tick**. The space between the tics and tocks will be even when the clock is "in beat". If the clock is more in beat with one side slightly raised, then the clock may be left with a small cardboard shim under that side, or the movement may be adjusted.

To adjust the beat, with the clock sitting level, or on the shelf where it will be run, locate the **crutch wire.** Hold the crutch wire just below the verge and bend the wire very slightly so that the loop end moves toward the side of the case that needed to be raised. Now check the beat again. If the clock is in beat, you are finished. If not, then repeat the procedure until the clock is in beat. A very small adjustment can make a big difference. Caution, weight driven clocks are top-heavy and tip over easily when the weights are at the top of the case. Keep the weights near the bottom of the case during adjustment.

If the clock is so badly out of beat that it will not run at all (usually from having the crutch bent during shipment or careless adjustment), place a small ruler or paper scale under the pendulum bob. Note the "at rest" position of the pendulum on the scale. Slowly move the pendulum left and right and listen for the escapement to tick. Note how far left and right from rest the pendulum is when the "tick and tock" occur. Bend the crutch wire until the "tic and tock" occur at about the same distance from the center resting position. The beat should then be close enough that the clock will run and a final adjustment made as previously described.

If your clock has a flat metal crutch instead of a wire, it may have other provisions for setting the beat, and should be referred to a qualified clock repairperson. Some newer clocks have automatic beat correction.

## SETTING YOUR CLOCK TO THE CORRECT TIME

Generally, old clocks are set by turning the minute hand until the correct time is displayed, but unless the proper procedure is followed the clock may be severely

damaged! If your clock still has it's original label, then follow the makers instructions for setting your clock. Lacking the maker's instructions, the following guidelines should work for most clocks:

1. One safe way to set any clock, and the best way to set a clock back an hour when daylight savings time ends, is to simply stop the clock and wait until the indicated time and the correct time of day are the same, then restart the clock.

2. If the clock is a time only clock (a timepiece that does not strike), then the minute hand can usually be turned in either direction to the correct time. The hour hand should not be moved, and the minute hand should never be forced backward if resistance is encountered.

3. If the clock is a striking clock, then several rules apply:

   (a) The clock may be set **forward** by turning the minute hand to the right or clockwise to the correct time of day, pausing to allow the clock to strike and/or chime at the appropriate times. Always allow the clock to complete the strike sequence before continuing to move the minute hand. The hour hand should not be moved.

   (b) The clock may be set **backward** but some clocks can be badly damaged if special precautions are not adhered to:

      (1) **Never** set a clock backward if it is within 10 minutes of striking.
      (2) **Never** set a clock backward past the "12" position.
      (3) **Never** set a clock backward past any point where it would normally strike or chime.
      (4) **Never, never** force a clock backward if resistance is felt.

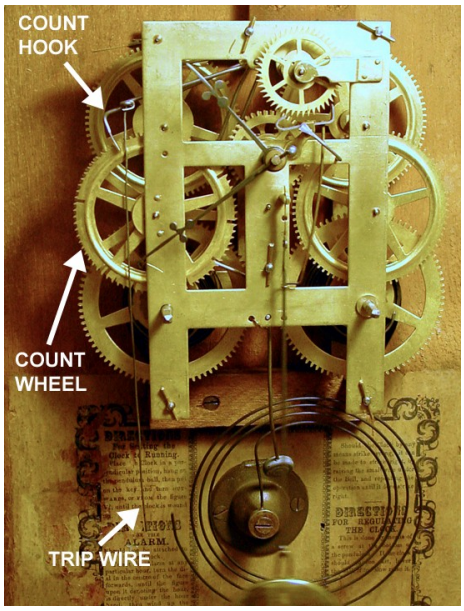
   Generally it's ok to set most clocks backward if these rules are followed. Some newer clocks, especially 20th century clocks, have "turnback" movements which allow the clock to be set backward past "12" without damage, but doing so may cause the clock to strike incorrectly. Most 19th century clocks made before the 1890s will be damaged if turned backward past the top of the hour (or half-hour if it strikes on the half hour).

4. When setting the minute hand to the correct time, move it forward a couple of minutes past the correct time and then move it backward to the exact time of day. There is by design a certain amount of free play in the gears that turn the clock's hands (the motion works). Making the last setting movement a backward movement "takes up the slack" and allows the clock to begin moving its hands immediately after being set. If the last movement is forward, the clock may have to run a for a minute or so before the hands actually start moving. Never turn the clock backward past "12" or a striking point.

**SETTING YOUR CLOCK'S STRIKE TO MATCH THE INDICATED TIME**

Occasionally, a clock's striking sequence will get out of step with the time causing the clock to strike incorrectly. This most often happens when the strike side of the clock

has “run down” while the time side continues to run. Most antique American clocks use a “count wheel” strike system. The time side of these clocks does not drive the count wheel so the strike side does not “know” the time of day. It only “knows” how many strikes it sounded the last time (and how many strikes to sound the next time). The time side of the clock simply “tells” the strike side when it’s time to strike again but not how many strikes to sound. Getting a clock like this back “in strike” requires making it strike repeatedly until the count wheel advances to match the time of day (The count wheel cannot be set backward.) The exact procedure will depend on the particular clock.



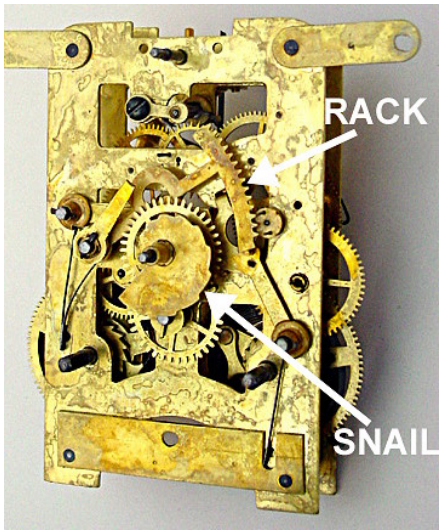

The picture shows a typical American striking clock with a **count wheel**. The wheel has a series of deep slots spaced farther and farther apart corresponding to the number of strikes to be sounded. The wheel advances during the striking until the **count hook** drops into one of these deep slots at which point the striking stops. Gently raising the count hook out of a slot will cause the clock to strike the next hour’s sequence.

Clocks with front opening doors frequently have a **trip wire** attached to the count hook with the free end of the wire protruding below the clock dial. To put a clock like this “in strike” simply push upward on the trip wire until the clock begins to strike. Allow the clock to finish striking, then repeat until the clock strikes the correct hour.

If the trip wire is not present, it may have been left off during a repair, or the maker may have specified a different method of putting the clock in strike. If the count hook is visible, gently raising it with a small screwdriver of piece of stiff wire will cause the strike to begin.

If the clock has a turn-back movement, turning the minute hand backward past “12” to “9” and then forward past “12” will cause the clock to strike the next hour. WARNING: turning a clock that does not have a turn-back movement backward past “12” will damage the clock. If the maker’s label does not say that it is a turn-back clock, or if the label is missing, the safest thing to do is to ask a clock repairperson to check what type of movement is in the clock.

If the count hook is not accessible and the clock is not a turn-back model, then the minute hand should be moved to the “12” and the number of strikes counted. The hour hand may then be moved forward or backward to the hour indicated by the strike. Care must be exercised to avoid bending an hour hand that may be very tight or stuck on its shaft. Repeatedly moving the hour hand to correct out-of-strike problems can cause the hour hand to become loose and possibly slip. A clock that frequently gets out-of-strike for no good reason should be serviced by a qualified clock repairperson.




Some American clocks have what is known as a rack and snail strike mechanism, which will automatically correct any error the next time the clock strikes. If a rack and snail does not strike correctly, the hour hand should be moved to the correct hour as described above. If it continues to strike

incorrectly, then the clock should be serviced by a qualified clock repairperson.

The picture (right) shows a typical American clock movement (Waterbury) with a rack & snail strike system. The “snail”, which is permanently attached to the hour hand tube, controls the number of times the clock strikes. Unless the hour hand slips or has been moved, this type of clock should always strike the correct number if times for each hour.

Sometimes a clock will strike the correct number of times but the striking will begin a few minutes before or after the top of the hour. This problem can be corrected, but strike and chime mechanisms are fairly complicated and should only be adjusted by a qualified clock repairperson.

**WINDING YOUR CLOCK**

Winding might seem to be the simplest part of caring for an old clock, but if done incorrectly, major damage can be done to the clock and/or personal injury can occur! Generally, a clock is wound by inserting a winding key or crank onto the winding arbor through a hole in the clock face. The key is turned until the clock is fully wound. It is a myth that a clock can be “wound too tight”. When fully wound, the key will simply not turn any further. Applying excessive force after a clock is fully wound will cause the weakest component to break and the clock will suddenly unwind and not be able to be wound at all. Once one learns the feel of the force, or the number of turns of the key, required to fully wind the clock, the recommended practice is to stop winding just before the clock is fully wound. It should be noted that the force required to wind a weight driven clock does not increase as the clock is being wound. When winding a weight-powered clock, stop winding just before the weights reach the top of the clock case.

Winding keys come in various sizes with Nos. 5, 6, and 7 being the most common. A key of the correct size will slip easily onto the winding arbor but will not feel loose. A loose or worn key can round off the corners of the winding arbor. Many old clocks are found with incorrect or badly worn keys, which should be replaced.

It is most important to **turn the winding key in the correct direction**. Unfortunately, there is no easy way to determine the correct direction other than careful trial and error. Some clocks wind to the right and some to the left. Some wind the strike and the time in the same direction and others wind the strike and the time in opposite directions. Forcing the winding key backward can damage the clock movement**.** This is especially true for clocks with wooden movements. If a gentle pressure in one direction does not result in the familiar click, click, click, sound of a clock being wound, then try the opposite direction before applying more pressure. Most clocks actually stop briefly during winding, so always make sure that the clock is ticking after being wound.

**WARNING, old clocks can bite!**

A click, click, click, sound is produced as a clock is being wound. The sound is made by a small metal (or sometimes wooden) pawl called a “click” passing over ratchet teeth on the main wheel arbor. The force of the powerful main spring (or weight if the clock is weight driven) is transferred to the clock’s main wheel through the small click and a tiny pin or rivet that anchors it. A small spring wire usually holds the click against the ratchet teeth.

Clicks frequently become worn, bent or loose and no longer lock securely on the ratchet teeth. Anchor pins and rivets can loosen or break, and click springs can become weak and fail to hold the click firmly in place. If any of these small parts fail, the powerful main spring will suddenly unwind (or the weight suddenly drop) with a furry unequalled by a woman scorned! If this should happen while the clock is being wound, which is the most likely time, the result is usually several lacerated fingers, some words not heard in church, and a fright that could, as the saying goes, “stop an 8-day clock”!

The best way to avoid being bitten by your clock is to regularly check the clicks, ratchets, and springs and keep them in good safe operating condition. A professional clockmaker will usually check the condition of the clicks and make needed repairs when servicing your clock. Do-it-yourselfers and amateur “clock fixers” frequently overlook this very important little detail.

When winding a clock, maintain a firm grip on the key and release the pressure slowly after each half-turn, making sure that the click has engaged the ratchet and is holding back the spring before releasing the key. If the ratchet fails hold back the spring (and the key has not already slipped out of your hand), try to turn the key one or two clicks tighter and see if the ratchet will lock on a different tooth. If it does, then pull the key out of the clock and DO NOT ATTEMPT TO FINISH WINDING IT. If the clock will run, allow it to run all the way down then have it repaired before attempting to wind it again.

If the ratchet cannot be made to engage and hold back the spring, you are definitely in for some tense moments. Theoretically, one should be able to carefully let the key turn backward a half turn at a time until the spring is completely unwound or “let down”, but most who try this technique end up with cut and bruised fingers when the key slips out of their hand. Some suggest getting a firm grip on the key then pull it carefully from the clock and just allow the spring to unwind on its own. Others say just let go of the key and get your hand out of the way as quickly as possible and hope for the best. Keep in mind that an unrestrained key may fly out of the clock and break the glass or cause other collateral damage as it spins rapidly backward with the unwinding spring.

## REGULATING YOUR CLOCK

All clocks have some means to adjust how fast or slow they run. Clocks with pendulums are regulated by raising or lowering the center of gravity of the pendulum. This is usually accomplished by turning the rate-adjusting nut at the bottom of the pendulum bob. Turning the nut to the right and raising the bob on its support rod will make the clock run faster. Turning it to the left and lowering the bob will make the clock run slower. When lowering the bob, after the adjusting nut has been turned, make sure that the bob has slipped down its support rod and is resting against the nut. Some pendulum bobs fit snugly and may not slide down without help. The picture at the right shows a typical American clock with a pendulum and rate-adjusting nut.


Many mantel and shelf clocks, especially those made in the 20th century, have a rate adjustment control on the clock face (photo on next page). Most of these clocks

came with a double-ended winding key. The smaller end is used to turn the rate adjuster. The words “fast – slow”, or the letters “F – S” should be printed near the adjuster to indicate which way to turn it to speed up or slow down the clock rate.


These adjusters effectively lengthen or shorten the pendulum by changing the point where the pendulum suspension spring is clamped. If the clock does not respond to adjustment, the key may be the wrong size to turn the adjuster arbor. Lacking the original key, some sellers substitute whatever key is available, and one size does not fit all. If the clock can be made to run faster but not slower, then the suspension spring may be slipping in its mount (not uncommon) and the clock should be serviced.

Clocks without pendulums (marine or lever movements with balance wheels) also have “fast – slow” adjustments. These come in several different forms, but they are usually well marked and the regulating process is the same as for pendulum clocks.

**Step One:** This procedure will determine if your clock is capable of keeping time and set a rough or “ball park” adjustment. Begin by winding the clock completely, then let it run for about 4 hours. If after 4 hours the clock is within 2 or 3 minutes of the correct time, let it run for another 20 hours and skip down to “Step two” below.

If the clock is more than 3 minutes slow after 4 hours, turn the adjuster a few turns toward fast or raise the pendulum bob about ¼ inch to make the clock run faster. If the clock is more than 3 minutes fast, turn the adjuster a few turns toward slow or lower the pendulum bob about ¼ inch to make the clock run slower.

Don’t be concerned about making too large an adjustment. Repeat this procedure until the clock is off just a little in the opposite direction (i.e. A slow clock is now a little fast or a fast clock is now a little slow). You now know that the clock can be adjusted over a range that includes the correct rate. If not, see “problems regulating your clock” below.

**Step Two:** Make sure the clock is fully wound and set to the correct time. Allow the clock to run for 24 hours. If after 24 hours the clock is within 2 or 3 minutes of the correct time, let it run for another 6 days and skip down to “Step Three” below.

If the indicated time is off by more than three minutes after running a full day, turn the rate adjustment just a little (maybe ½ turn) toward fast or slow as required. Wind the clock again, set the time, and allow it to run another 24 hours. Repeat until the clock is off by no more than 3 three minutes in 24 hours.

**Step Three:** Make sure the clock is fully wound and set to the correct time. Allow the clock to run for 7 days (1 week). During this time, do not adjust the clock rate or set the time. If the clock is a 30-hour (one-day) clock, wind it fully once every day. Do not wind an 8-day clock during this period. If indicated, make a small adjustment and repeat this step until the clock is off by no more than 3 after a week.

## PROBLEMS REGULATING YOUR CLOCK

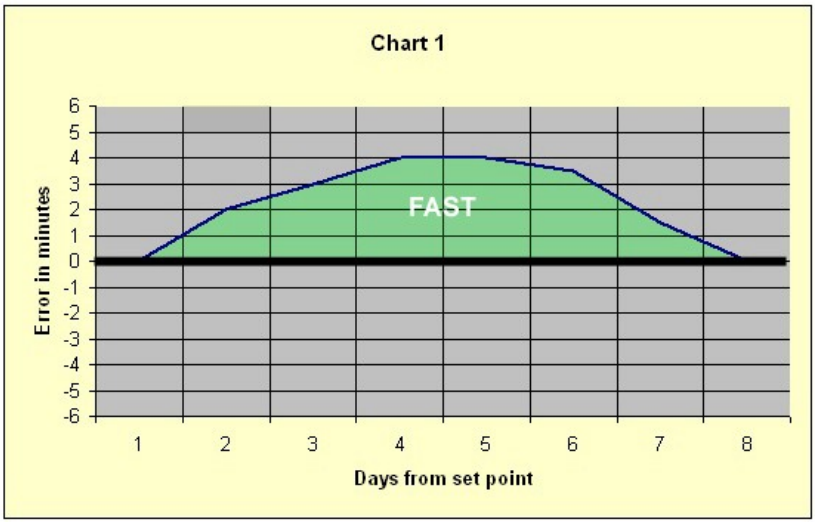
The following are typical problems that are often encountered when attempting to regulate an old clock:

(1) The clock slows excessively or stops before the end of the week. The clock needs to be serviced and may have “tired springs” which should be replaced.

(2) The rate adjustment is turned as far as it will go and the clock is still running too fast or slow. This is a common problem with clocks purchased at flea markets and auctions where the original pendulum or movement has been lost and replaced with an incorrect substitute. Calculating the exact pendulum length goes beyond the scope of this paper. Have a qualified repairperson check your clock.

## CALIBRATING YOUR CLOCK (for spring powered clocks only)

Calibrating your clock ensures that it will, as nearly as possible indicate the correct time of day every day of the week. This should not be confused with “regulating” your clock. A typical spring powered 8-day clock may run a little fast right after being wound and a little slow near the end of the week. If properly regulated and set to the correct time of day at the beginning of the week, such a clock will again indicate the correct time of day at the end of the week but it will be “fast” every day during the week. Chart No. 1 represents an 8-day clock that was set to the correct time (zero error) when wound and after 1 week, it again indicated the correct time but it was as much as 4 minutes fast at the middle of the week.



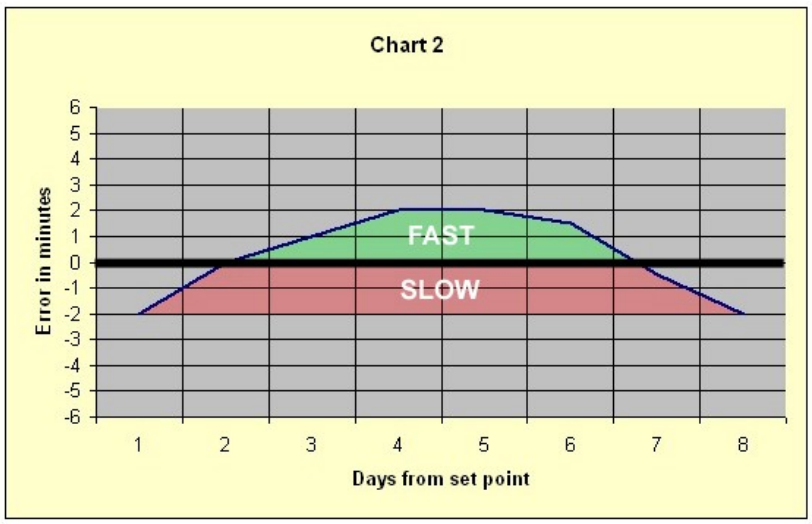




Chart No. 2 represents the performance of the same clock except that the clock was set to be 2 minutes slow when wound at the beginning of the week.

Setting this clock two minutes slow at the beginning of the week will ensure that it is never off by more than

two minutes at any time during the week. If the clock is regulated such that it has a zero net gain or loss of time from the start to the end of the week, then take ½ the maximum fast error during the week and set the clock that many minutes "slow" when the clock is wound. Complicated mathematical calculations can be used to more precisely calculate the offset, but this method should work just fine for most people. Weight powered clocks run at a constant rate between windings and calibration should not be required once the clock is regulated. Spring powered clocks that require winding every day (30 hour clocks) do not need to be calibrated because the offset is usually too small be significant.

## CLEANING AND OILING YOUR CLOCK

Clocks require only a tiny amount of oil. Excess oil only serves to attract dust and dirt. If your clock is being professionally maintained on a regular basis, no additional oil should be required. If your clock needs oil, it may also need cleaning. Professionals agree that the only way to properly clean a clock movement is to completely disassemble it first. **WARNING: never try to take apart a spring powered clock without first restraining and "letting down" the powerful main springs. Failure to do so can result in personal injury and damage to the clock.** Almost any good quality light machine oil may work in the short term; however, oils specially formulated for clocks may stay in place and perform better in the long term.

Many clocks made before about 1840 have movements made almost entirely of wood. The metal pivots of wooden clocks, running in wooden holes, as well as the other wooden parts should not be oiled.

## REPAIRING YOUR OWN CLOCK

If one is mechanically inclined and comfortable working with small parts, learning to repair old clocks can be as enjoyable and satisfying as owning them. Begin by reading some of the many excellent books that have written on the subject. *Clock Repair Basics*, by Steven G. Conover is an especially good one, available from Amazon, Time Savers, Some special tools will be necessary, but the tools needed for basic repairs are relatively inexpensive and often available "used" on e-Bay. New tools and parts are also available from www.timesavers.com and other fine vendors on-line. Tools can be acquired and skills learned as needed. One should not expect to become an expert overnight, or attempt to completely outfit a clockmaker's shop all at once. Start learning with simple inexpensive clocks and basic repairs. The National Association of Watch and Clock Collectors, Inc. http://www.nawcc.org/ maintains an excellent message board where experts are always available and willing to help with clock repair advice.

A 30-hour weight-powered "OG" clock (see picture to the left) makes an excellent starter clock. Untold thousands were made in the latter half of the 19th century. They have no dangerous main springs, require no special service tools, and have simple movements with very few parts. Several are usually listed on eBay at any given time,

and the prices can be very reasonable. Many replacement parts are available, and when the project is complete, you will have an excellent timekeeper.

**MOVING YOU'RE YOUR OLD CLOCK** (especially clocks with pendulums & weights)

If a clock is to be moved, even a short distance (to another room for example), the pendulum must be removed to prevent damage to the movement. The pendulum support leader should be secured with a rubber band or by similar means to prevent the leader from swinging. If the clock has a mercury jar pendulum containing mercury, special precautions are necessary. Please contact a qualified professional before moving a mercury jar pendulum.

If the clock is powered by weights, the weights must be removed and all cords, cables and chains secured before the clock is moved. Weight removal is usually easier when the clock is first allowed to run down so the weights will be lower in the case. Weight driven clocks are especially top heavy and can easily tip over when not attached to a wall.

If the clock is a chiming clock – plays Westminster or other tunes on the quarter hour – sound rods, tubes, and other parts may also need to be removed or supported. A professional clock repairperson should be consulted for advice before attempting to move such a clock.

Shipping a clock can be a real challenge. Many professional shippers/movers do not understand antique clocks, and many clock people do not understand the forces encountered by packages during shipment. Whenever possible, a professional clock repairperson should work with the shipper or mover. The shipment should be adequately insured. NEVER ship weights in the same package with the clock.

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