

Adjusting Bendable Banking Pins in Antique Pocket Watches

Introduction: Antique American and Swiss pocket watches (19th to early 20th century) often use **bendable steel banking pins** (friction-fit posts) to fine-tune the lever escapement. These tiny pins limit how far the pallet fork (the “lever” holding the pallet jewels) can swing from side to side. Proper adjustment of the banking pins is crucial: it affects how the **pallet stones** lock and unlock the escape wheel teeth, and it ensures the **safety action** (the guard pin and roller table mechanism) works correctly to prevent overbanking (when the lever accidentally flips to the wrong side of the balance roller). In this guide, I’ll try to use clear step-by-step instructions to explain how to identify, access, and adjust these pins. I’ll also cover the tools you need, the effects of moving the pins, how to achieve optimal escapement performance, and how to avoid common risks or mistakes. Let’s get started on making that old pocket watch tick reliably again!

Understanding Banking Pins and Their Function

The **banking pins** (sometimes called “bankings”) are two small steel posts that physically stop the side-to-side travel of the pallet fork lever. In older pocket watches, these pins are often **friction-fit** into the plate (pressed in, not threaded), which means a watchmaker can adjust them by gently bending or shifting them. By limiting the lever’s swing, the banking pins assure the **proper geometry between the pallet jewels and escape wheel teeth**. In simpler terms, they make sure each **escape wheel tooth** locks on a pallet jewel just the right amount and then releases properly as the balance swings. The pins also maintain the relationship between the **guard pin** (safety dart) on the pallet fork and the **safety roller** on the balance. If the watch gets a jolt, the banking pins and safety parts together prevent the lever from flipping over too far (which would cause a jam called *overbanking*). Without correctly positioned banking pins, the escapement (the ticking heart of the watch) could either **lock up** (if pins are too tight) or **slip/overbank** (if pins are too loose).

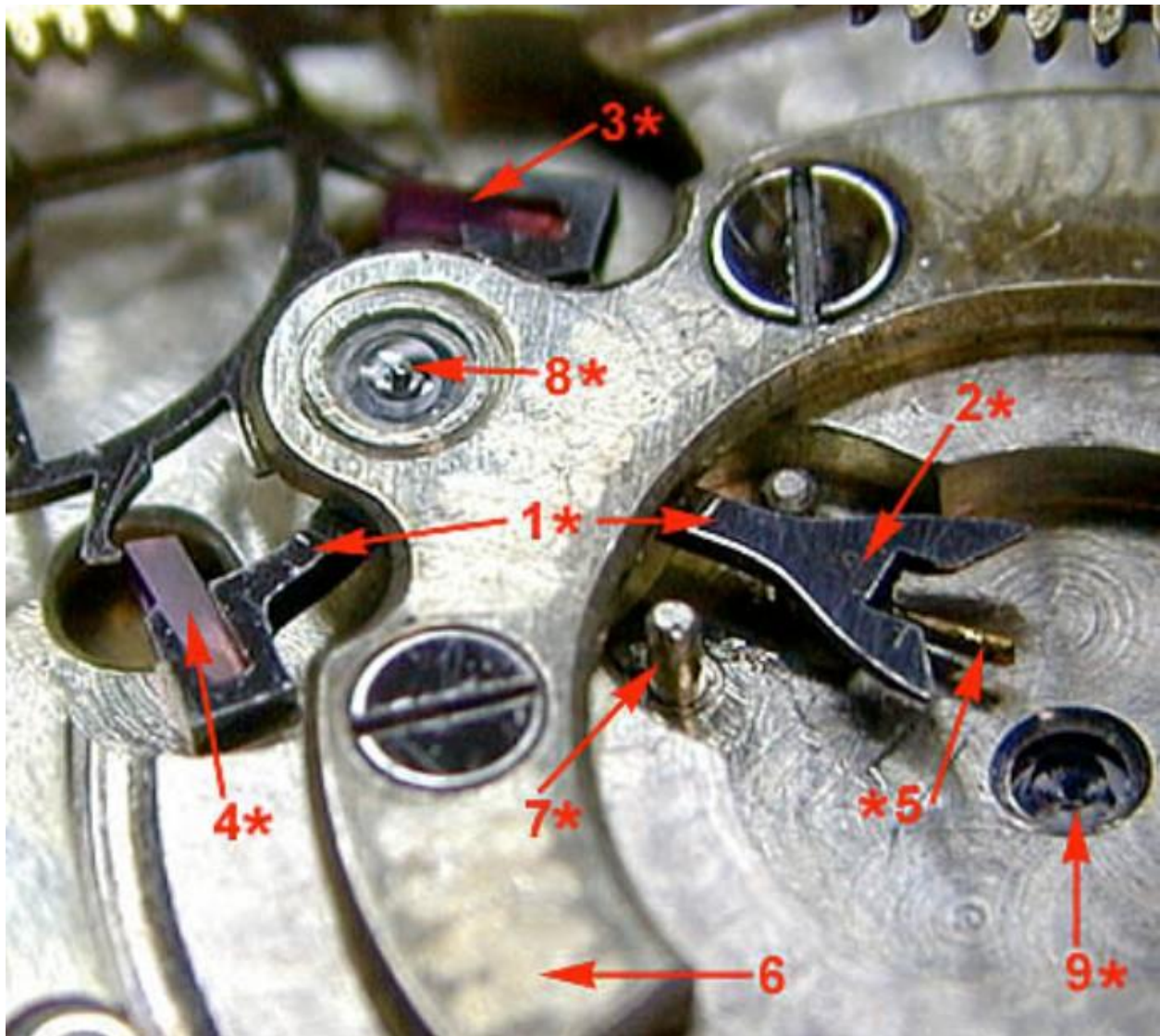
In many vintage watches, the banking pins are **adjustable** on purpose. Back in the factory, skilled adjusters would set the escapement by positioning the pallet stones for correct lock and then moving the banking pins for final fine-tuning. They adjusted the pins to get a tiny amount of “run to banking” on each side – meaning after an escape tooth locks on a pallet stone, the lever should move just a little further until it contacts the pin. This little extra movement uses the **draw** (a slight angled pull of the escape tooth on the pallet) to keep the lever firmly against the pin during the balance’s swing. In modern watches, banking pins are often fixed as part of the design (not meant to be moved), but on antique models, they were a practical way to fine-tune the escapement. If someone in the past tampered with these pins or if parts were swapped (like a new pallet fork or escape wheel installed), the pins may now be out of ideal position. That’s why a watchmaker servicing an old watch sometimes needs to adjust them.

Summary: Banking pins act like “goal posts” that the pallet fork hits at each end of its travel. When adjusted correctly, they ensure the **pallet stones** lock the escape wheel teeth by a small amount (for reliable locking) and then let go with the right timing. They also preserve the **safety**

action, preventing the balance's impulse jewel from slipping past the fork (overbanking) in case of a shock. Next, we'll identify where these pins are and what tools you need before adjusting them.

Identifying and Accessing the Banking Pins

*An antique watch movement showing the lever escapement. The two **banking pins** (marked with red arrows and label 7) are small steel posts on either side of the pallet fork. They limit the fork's travel and can be adjusted by careful bending.**



On a traditional pocket watch movement, the **banking pins** are usually easy to spot once you know where to look. They are typically located on the movement plate, flanking the path of the **pallet fork** (the T-shaped lever with ruby jewels at its ends). In many American watches, you'll find them on the **main plate** near the pallet fork's pivot area, appearing as two tiny upright pins

or screws. In some full-plate designs, they might be mounted on the **pillar plate** (the main plate under the dial) and protrude upward to contact the lever. Here's how to identify and access them:

- **Visual Identification:** Using a loupe or magnifier, look for two small metal posts positioned such that the fork's long tail (or the fork tines) would hit them at each end of its swing. In the image above, the banking pins are indicated by arrow 7. They may have a polished (shiny steel) appearance. Some high-end watches even used small screws or ruby-tipped pins, but most often they are plain steel pegs.
- **Friction-Set vs. Screwed Pins:** Bendable banking pins are usually friction-fit (press fit). This means they don't have screw slots on top; they're essentially smooth pins driven into a hole. If your watch has what looks like eccentric screws with slots, those are adjustable by turning (not bending) – but many 19th-century models instead have friction pins you adjust by bending.
- **Do not try to turn a friction pin** – it's not made to rotate and forcing it could break it.
- **Accessing the Pins:** To adjust the pins, you need physical access to them. Plan to at least remove the **balance wheel and balance cock** for better access (more on this in the step-by-step). Removing the balance also prevents any accidental damage to the balance spring while you're working on the escapement.
- **Magnification and Lighting:** The banking pins and pallet fork are tiny components. Use good magnification (a watchmaker's loupe around 10 x is good and a microscope is ideal) and ensure you have bright, even lighting. Being able to clearly see the gap between the pallet jewel and escape wheel tooth, or the clearance between the guard pin and roller, is essential for making accurate adjustments. A pair of tweezers under magnification can easily slip, so visibility is key.

In summary, find the two small posts that the lever contacts. Once you've identified those banking pins and gained access by removing necessary parts, you're ready to adjust them. In the next section, we'll list the tools you'll need and then go through the adjustment procedure step by step.

Tools and Equipment Needed

Before attempting to adjust bendable banking pins, gather the proper tools and prepare your workspace. Working on a watch escapement is delicate, so having the right equipment will make the job safer and easier:

- **Magnification:** A watchmaker's loupe (around 10x magnification) or a microscope is a must. You will need to clearly see tiny gaps and the positions of the pallet stones relative to the escape wheel teeth. Good magnification helps prevent eye strain and mistakes.
- **Fine Tweezers:** High-quality, fine-point watchmaker's tweezers (size #3c or similar) are useful for manipulating small parts. You can use tweezers to gently push or bend the banking pins, but **caution:** only use tweezers if they have a good grip and you are very steady, since a slip could scratch the plate or bend something else unintentionally.
- **Small Pliers or Lever Tool:** Some watchmakers prefer a tiny smooth-jawed plier or a special tool to adjust banking pins. For example, a hollow tube or a modified screwdriver shaft can be slipped over a pin to bend it with control. The tool should let you *bend the*

pin at its base rather than the tip – bending at the base reduces the chance of kinking or breaking the pin. The Swiss even make specific tools, Bergeon tool 1856 for tweaking fixed banking pins by bending, though you can improvise with care.

- **Pegwood or Toothpicks:** A piece of pegwood (a hard wood stick) is handy to manually move the pallet fork or to press on the escape wheel teeth gently during testing. Wood is softer than metal, so it won't easily damage the steel parts if used carefully.
- **Small Screwdrivers:** You'll need appropriate screwdrivers to remove the balance cock, dial screws, or any case screws. (While not directly used for bending pins, you need them for disassembly to access the pins.)
- **Bench Key or Winder:** You should be able to apply or release a bit of mainspring power as needed. A bench key or the watch's key (for key-wound) or winding stem (for stem-wound) will let you wind and unwind safely. You may need to let the mainspring down fully when disassembling, and wind a turn or two when testing escapement function.
- **Optical Visor or Additional Light (Optional):** In addition to a loupe, some watchmakers use an Optivisor or similar headband magnifier for a broader view. A task lamp or LED illumination directed at the movement can help highlight the escapement area, making it easier to judge tiny clearances.
- **Cleaning Rodico or Pithwood (Optional):** It's good practice to ensure the escapement is clean before adjusting. A tiny speck of lint can throw off your perception of how things are moving. A bit of Rodico putty can remove dust, and pithwood can clean pivot tips and jewel holes. This isn't a tool for adjustment per se, but a clean escapement will give more consistent results.

Preparation of the Movement: Make sure the watch is stopped with the mainspring **let down** (fully unwound) before you begin disassembly. Remove the **balance assembly**: unscrew the balance cock and lift out the balance wheel with its spring – set it aside safely. Now you can see the pallet fork and the banking pins clearly. At this point, **only a small amount of power** should be applied during testing, as we'll describe. Be ready with your tools to adjust the pins incrementally.

With tools in hand and the movement prepared, we can move on to adjusting the banking pins themselves. The next section provides a step-by-step walkthrough of the process.

Step-by-Step Procedure for Adjusting Banking Pins

How Banking Pin Position Affects Escapement Lock & Drop

Understanding the mechanics will help you appreciate why you adjust pins in a certain direction. The **escapement** has a few critical phases: lock, drop, and impulse. The banking pins mainly influence the **lock and drop** phases by limiting how far the lever moves. Here's what happens when you move the pins:

- **Pins Closer Together (Tighter Pins):** Pushing the pins inward means the pallet fork hits them sooner. This **reduces the lock** on each pallet stone because the escape wheel tooth cannot travel as far onto the jewel before the lever stops. In other words, the pallet stone

will engage a shallower portion of the tooth. If the pins are too tight, the tooth might barely lock or could even miss locking altogether, causing the escapement to slip. Tight pins also **reduce the drop** (the distance a tooth falls off the pallet during unlocking) because the fork doesn't swing as wide. While minimal lock might seem to reduce friction, too little lock is dangerous – the tooth can slide off the jewel prematurely (leading to “flutter” or skips). Also, overly tight pins constrain the **guard pin clearance**. The guard finger might be almost up against the safety roller, potentially stopping the watch if there's any slight misalignment. Tight pins can even cause the impulse jewel to **scuff the fork horn** as it enters or leaves the fork, since the fork's position is more constrained. The watch might run *faster* (since the pallets barely lock, giving impulses quicker) but with very low amplitude or inconsistently.

- **Pins Farther Apart (Looser Pins):** Pulling the pins outward allows the pallet fork to swing further to each side. This increases the **total lock** – the escape wheel tooth goes deeper onto the pallet stone before the fork is stopped. More lock can make the escapement safe in terms of not slipping, but too much lock wastes energy and can cause the balance to have to swing further to unlock. The **drop** (when the tooth leaves the pallet) will be larger too, which can introduce more error in timing and slight recoil. If the pins are excessively far apart, the lever might travel so much that the **guard pin doesn't engage in time** during a shock, leading to **overbanking**. Overbanking is when the impulse pin (roller jewel) slips to the wrong side of the fork – the watch will stop dead because the fork is now stuck on the wrong side of the balance. Additionally, if the balance swings very far (e.g., a strong mainspring or a big motion), loose pins might let it “**knock**” – basically the impulse jewel hits the fork or the fork bangs the banking pins on its own due to excessive amplitude, making a knocking sound and causing irregular timekeeping. So, while you want some freedom, too much gap is hazardous. The watch may run *slower or inconsistently* if the pins are far apart, and it might suddenly stop if it overbanks on a strong swing.

It's a Goldilocks situation: not too tight, not too loose. The banking pins do **not change the escape wheel's geometry** or pallet angles; they *cannot fix* a badly set pallet stone lock or wear on teeth. They only change where the lever's travel halts. In a properly set escapement, they are used to fine-tune the “**run to banking**” – that small extra lever motion after locking. They **do not alter the “drop locks”** (initial locking engagement) directly; that's mainly the pallet stone positions' job. However, in practice moving the pins does effectively shallow or deepen how far the tooth goes before stopping against the pin, which is why careful pin adjustment can correct minor locking issues without moving the stones.

Key points:

- Moving a pin **inward** = shallower lock on that side, less run, tighter safety clearance.
- Moving a pin **outward** = deeper lock on that side, more run, looser safety clearance.
- Both pins affect the overall balance of the escapement. Ideally, both sides should have equal lock, equal drop, and equal safety margins. One pin too far or too close relative to the other will make the watch out of beat or cause asymmetric issues.
- **Amplitude and Timing:** If pins were way misadjusted, correcting them can improve the balance amplitude and timing. For instance, if someone had squeezed the pins in

incorrectly, the watch may have low amplitude and run oddly; opening them to the correct position will allow a healthier swing and proper timing. Conversely, if the pins were too open and the watch was overbanking or knocking (maybe running fast and erratic), bringing them in will stabilize the beat.

In summary, the banking pins are like adjustable “bumpers” for the pallet fork. Adjusting them changes how far the fork (and thus the pallets) can go, which in turn adjusts how the escapement locks and unlocks. Next, we’ll dive a bit deeper into the **safety action** and how the correct pin adjustment keeps the watch safe from overbanking, while still allowing free motion.

Safety Action and Escapement Performance

A critical aspect of escapement adjustment is ensuring proper **safety action**. The safety action involves the **guard pin** (also called the safety finger or dart) on the pallet fork and the **safety roller** (a small disk on the balance with a notch or just an edge for single roller) attached to the balance. The purpose of these is to prevent the pallet fork from accidentally moving to the wrong side of the balance impulse pin (the roller jewel). Proper banking pin adjustment goes hand-in-hand with proper safety action:

- **What is Safety Action?** In normal operation, the **draw** of the escapement (the slight angle on the pallet stone locking faces) pulls the pallet fork against one of the banking pins and keeps it there while the balance completes its swing. If the watch gets jarred or the balance swings too far, the lever might momentarily lose contact with the banking pin. In that moment, the guard pin is there to catch on the rim of the safety roller so that the fork **cannot** slip entirely to the opposite side (which would be an overbank). Essentially, the guard pin will hit the solid part of the roller and **push the lever back towards its proper side**, re-locking the escapement if needed. This happens in a split second and prevents a total jam.
- **Role of Banking Pins in Safety:** The banking pins set the limits for where the guard pin sits relative to the roller. If the pins are set correctly, when the fork is against a pin, the guard pin will be **aligned just outside the rim of the safety roller**, with a small gap. Under a shock that tends to overbank, the guard pin will immediately meet the roller’s edge and stop further motion. If the pins are too far apart, the lever can swing so much that the guard pin might **miss the roller edge or notch** entirely, meaning nothing stops the fork from crossing over – an overbank will occur and the watch stops until manually reset. If the pins are too close, the guard pin might be **pressed hard against the roller even in normal use**, causing friction or preventing the fork from unlocking at all.
- **Checking Safety Clearances:** With the banking pins adjusted, you should verify that in each extreme fork position (lever against either pin) the **guard pin** just **nearly** misses contacting the roller. There should be a **tiny clearance** – for example, I was taught that the guard pin clearance should be about **0.02 mm** or so (just enough for a sliver of light). This ensures the guard pin isn’t rubbing during normal swings (which would stop the watch), but is close enough to catch the roller if the lever tries to go further. You can test this: with the balance installed, gently push the balance as if to overbank and see if the guard pin touches the roller. It should hit the roller’s outside before the impulse jewel slips out of the fork. If you remove the balance and manually push the fork past the

banking pin, you should see the guard pin collide with the balance staff or roller and **physically prevent** the fork from going past the center. If it doesn't collide when it should, your pins might be too wide. If it collides too early (fork can't even reach the banking because guard pin hits the roller first), the pins might be too tight or the guard pin might be bent.

- **No “Slop” or Excessive Free Play:** Properly adjusted pins also mean that when the roller jewel has just exited the fork (at the end of an impulse), the fork's guard pin isn't sitting far from the roller – it's right there in case the balance reverses direction suddenly. If there's too much space (excessive guard pin **freedom**), the lever might jiggle or bounce, and that can lead to problems like **double ticking**. You should note that guard pin freedom should be about half the pallet “corner” freedom – essentially a balanced small gap. Without diving into those technicalities: just remember **small gap good, zero gap bad, huge gap bad**.
- **Impact on Performance:** When safety action is correct and banking pins are right, the watch will have a healthy tick and be immune to common escapement stoppages. You won't get random stopping from overbanking, and the guard pin will quietly do its job only in shocks (which you may never visually notice). If safety action is off, the watch might run fine until a slight jolt or an overly vigorous winding causes an overbank. Overbanking usually manifests as the watch stopping suddenly, with the balance stuck and not oscillating. On inspection, you'd find the impulse jewel pinned against the outside of a fork horn. The cure is adjusting pins inward and/or ensuring the guard pin is the correct length. Historically watchmakers would often **lengthen a guard pin** if they found overbanking occurred even with correct banking pins – but that's another topic. Generally, if you trust the guard pin length is factory, focus on the banking pin spacing to solve safety issues.
- **Avoiding Overbanking and “Knocking”:** Overbanking is an extreme case. A more common mild issue is *knocking* or *banking* – when the balance amplitude is so high that the impulse jewel or fork horn just taps something it shouldn't (like the back side of a pallet fork horn hitting the impulse jewel because the fork traveled too far). Proper banking pin positioning can limit the maximum amplitude to just under the point where knocking happens. In well-adjusted high-grade watches, the balance can swing very far without knocking because the geometry is perfect. But if you ever hear a rapid tick-tick-tick at high wind (indicating the escapement is unlocking early or double ticking), slightly closing the pins can mitigate this by ensuring the lever catches the impulse pin promptly on each swing.

Safety Checklist After Adjustment:

- With the movement assembled, **tilt and gently jar** the watch (not too hard) to simulate a mild shock. The watch should continue running. If it stops, inspect for overbanking.
- Look at the pallet fork while the balance oscillates. The guard pin should never visibly rub the safety roller. You shouldn't see any vibration or jitter in the fork aside from its intended motion.
- If the watch stops and the balance is free but the fork is stuck, that's likely a guard pin vs banking issue. Double-check pin spacing and guard pin alignment.

Ensuring proper safety action is as important as getting the locks right. A beautifully locked escapement that overbanks at the slightest bump is not practical. Fortunately, by following the procedure and guidelines above, you likely have both aspects dialed in. Next, we'll consolidate some **guidelines for optimal positions** and signs to watch for, as well as cover any final tweaks to achieve peak escapement performance without compromising anything.

Achieving Optimal Escapement Adjustment

To wrap up the adjustment process, let's summarize the guidelines for optimal banking pin positioning and how to get the **best escapement performance**:

- **Balanced Lock on Both Pallets:** Each pallet stone (entry and exit) should lock the escape wheel tooth by a **small, equal amount**. As a rule of thumb, aim for about **1/4 to 1/3 of the impulse face** in lock (around 20%–30%). This is enough that the tooth is secure and won't slip off, but leaves plenty of the stone for impulse. If one stone consistently locks much deeper than the other, adjust the pins (or ultimately the stones if needed, but pins first) to even them out. Equal lock helps the watch beat evenly and reduces positional errors.
- **Sufficient Run to Banking:** There should be a **tiny free movement** of the lever after the tooth locks, before it hits the pin. You might see the lever move a degree or two – just a sliver of motion. This run is caused by the draw angle pulling the lever to the pin. It is critical for stability; it ensures the lever stays against the pin until the balance comes back. Too much run (lever flopping a lot) is inefficient and could lead to a slapping sound or slightly delayed impulse; too little run (lever immediately on pin with no draw) can make the lock less secure. Practically, if you have the lock right as above, the run usually takes care of itself. The key is *both* sides have a small, visible draw-in to the pins.
- **Centered Pallet Fork (Beat Adjustment):** After you finish, with the balance out, check that the fork still centers between the pins. If one pin ended up noticeably closer than the other, the watch may be out of beat. You want the fork to rest in the middle when the balance (hairspring) is at its natural resting point. If needed, adjust the pins together slightly (or correct the beat via the hairspring collet) so that in the end, the beat is right. A watch **"in beat"** means it has equal tick and tock timing, which is heard as an even cadence. This is easier on the watch and more accurate.
- **Guard Pin and Roller Clearance:** Ensure the **guard pin clearance** is minimal but not touching on each side, as discussed. If you have a *double roller* (with a crescent notch in the roller), ensure the guard pin enters the notch correctly when the fork is in the opposite position. If you have a *single roller* (just one roller table serving impulse and safety), ensure the guard pin aligns with the roller's outside. The banking pins dictate how far the fork can go, and at that position the guard pin must align with the roller's edge (not way off, not jamming into it). A good test is that the **guard pin should have about half the distance of the fork's end shake** as free play – though that's a fine detail. Practically, if it's not rubbing and not too distant, you are good.
- **No Overbanking, No Flutter:** The watch should not overbank during normal handling. It also should not "flutter" (rapidly tick multiple times) at full wind. Fluttering can happen if lock is too shallow. Overbanking happens if pins too wide or guard pin too

short. If you see any sign of these, tweak accordingly: for flutter, slightly increase lock, for overbanking, increase safety margin.

- **Amplitude and Timing:** With optimal pins, the balance will have a robust amplitude (for a cleaned, oiled watch, maybe 250° to 300° of rotation in dial-up position is common). The impulse will sound strong and even. You can double-check timekeeping on a timing machine if available – a well-adjusted escapement will show minimal beat error and stable rate across positions (assuming the rest of the watch is in order). If after pin adjustments you see a big beat error (e.g., ticks uneven in time), you likely need to tweak the beat (hairspring collet position) rather than pins. **Do not try to correct beat error by unevenly setting banking pins** – that will introduce other problems.
- **Lubrication:** Traditionally, escapement components like pallet pivots and banking pins are not oiled (except pallet stones). Do **not** oil the banking pins. They rely on a clean metal-to-metal contact. Oil would attract dust and change the behavior (plus the lever usually hardly slides on the pin; it just bumps it). Ensure the pallet arbor pivots and escape wheel teeth/pallet jewels are clean. A well-adjusted escapement can be ruined by dirt or gummy oil, so cleanliness matters.
- **Manufacturer Specs:** Some old watch manuals or guides provide specific measurements (like degrees of lock or specific clearances). If you have access to a manufacturer's service manual for the watch in question, it's wise to consult it. They might say something like "adjust banking pins so lock is X degrees and drop is equal" etc. Lacking that, the general rules above apply to most lever escapements.

By iterating carefully and following these guidelines, you'll achieve an escapement that locks safely, releases smoothly, and gives the balance a healthy impulse. The watch will have good **safety action** and should keep ticking steadily even if jostled.

Risks, Troubleshooting, and Corrective Actions

Adjusting banking pins, while not conceptually hard, is a delicate operation. There are some risks involved and sometimes things don't go as planned. Here's a rundown of potential issues, how to spot them, and what to do:

- **Risk of Breaking a Pin:** The banking pins are tiny steel posts. Bending them back and forth too much or at a sharp angle can snap them. **Prevention:** Make small adjustments and avoid bending at the same point repeatedly. If a pin appears very old and brittle (for instance, if it already has a kink or rust), be extra gentle. If you unfortunately break a banking pin, the watch will not function properly until it's replaced. Replacing a friction pin involves finding a correct-size pin and inserting it, which can be done but is an advanced task (sometimes you can use a piece of pivot steel or sewing needle as a replacement pin, cut and fit to size).
- **Loosening a Pin:** Similarly, if you bend a friction-fit pin too much, you might loosen its grip in the plate hole. If a pin starts to wiggle in its hole, the adjustments won't hold – it might move on its own. You can *carefully* try to tighten it by squeezing the hole (peening around it) or applying a tiny bit of shellac or Loctite, but it's tricky. It's better to avoid this by not over-bending. If a pin does become loose, you may need to remove it and

slightly deform its base (to make it a press fit again) or replace it with a slightly thicker pin.

- **Scratches or Slips:** When using metal tools near watch parts, there's a risk of scratching plates or bending something else accidentally. Always brace your hands, work under a magnifier, and use the smallest effective tool. Work slowly.
- **Watch Runs Worse After Adjustment:** If after your adjustments the watch runs worse (or not at all), systematically troubleshoot:
 - **Balance won't keep swinging:** Does it stop after a couple ticks? Check if the **pallet fork is hitting the roller** or guard pin issue. A likely cause is pins too tight – the guard pin might be interfering with the roller table (safety roller) immediately, acting like a brake. Open the pins slightly and test again. Also ensure the watch is in beat; an out-of-beat watch will stop because the balance can't unlock one side properly.
 - **Escapement Slipping/No Lock:** If the escape wheel is spinning freely or occasionally skips a beat (you might hear an odd double tick or see the second hand jump), then the lock is insufficient on one or both sides. This often means you pushed a pin too far inward. The cure is to bend that pin back out a bit to increase the lock. You want to eliminate any slipping. Watch carefully the engagement of each tooth – none should slide past without stopping the balance.
 - **Overbanking Continues:** If the watch still overbanks (gets stuck with pallet on wrong side) during a large amplitude swing or a bump, your pins might still be too far apart, or the guard pin might be too short. First try bringing the pins slightly closer together on both sides (maintaining symmetry to keep it in beat). If overbanking *still* happens and the lock is already reasonable, it might be the guard pin being too short (maybe a prior repair filed it). In such a case, one remedy is to **lengthen the guard pin** by a tiny bend or replacement. But only do this if absolutely necessary, as it's easy to make it too long (then it'll hit the roller and stop the watch outright). Usually, correct banking pin position should suffice.
 - **Low Balance Amplitude after Adjustment:** If the watch runs but the balance swing is small, there could be extra friction introduced. Check that the pallet stones aren't binding (did a pallet stone shift or something?). More commonly, check that you didn't inadvertently create a **lock that's too deep** – if the escape wheel tooth locks too far on the pallet, it might be robbing energy. Also, ensure you didn't bend the fork or alter the fork horns. A bent fork horn could be rubbing the roller jewel or balance staff. If lock and safety look fine, consider other factors like oil, pivots, balance jewels, etc. But if it correlated with your pin move, reverse that move slightly.
- **Uneven Tick (Out of Beat):** If you notice the tick and tock are not evenly spaced (the watch goes “tick---tock-tick---tock” with one interval longer), the escapement is out of beat. The **balance** returning to its neutral doesn't coincide with the lever being centered. This can happen if, say, you adjusted one pin significantly more than the other. The fix is to equalize the pins or adjust the beat via the hairspring collet on the balance. Don't leave the watch out of beat – it might run on a full wind but stall as it unwinds or in certain positions. Aim for a nice even tick-tock. You can correct beat by slightly rotating the hairspring collet in the direction needed (best done with specialized tools and very

carefully) or by offsetting pins (less ideal). The proper way is the collet; the pins should ultimately be symmetrical for an in-beat escapement.

- **Re-check After Some Time:** It's good to revisit the watch after it has been running for a while (say a day) to ensure the pins haven't shifted and everything is stable. Temperature changes or the settling of parts can sometimes alter clearances slightly. Typically, if the watch runs well for several hours in various positions, you've nailed it.
- **When Pins Aren't Enough:** There are times when no matter how you tweak the pins, you can't get a good result. For example, if the pallet stones were improperly set (too far in or out) by a previous repair, the escapement might have excessive lock on one side and scant on the other that pins alone can't fix without causing other issues. Or if the escape wheel or pallet fork was exchanged from another watch, the geometry might be off. In these cases, you may have to resort to **adjusting pallet stones** or obtaining correct parts. Adjusting pallet stones involves heating shellac and moving the jewels – a precise job usually done with specialized tools (pallet warmer).
- **Document Your Changes:** A tip is to take notes or even macro photos through your loupe of the pin positions before and after. This way if you get lost in adjustments, you can reference how it was initially (especially if the watch was sort of running before). You can even measure the distance between pins with calipers if accessible (or measure drop locks by eye). Knowing the starting point can be comforting if you need to revert.

In summary, adjusting banking pins carries the risk of creating new problems while solving others – but if you go slowly and methodically, you can avoid most pitfalls. The biggest signs of incorrect adjustment are a watch that **stops unexpectedly**, an escapement that **skips or double-ticks**, or a watch that goes **out of beat**. Each of these signs points to a specific likely misadjustment (too tight, too loose, or uneven pins, respectively). By recognizing the symptom, you can usually dial in the correction: open or close the pins slightly, or reset the beat. Always strive for that sweet spot where the escapement locks safely, the balance swings happily, and the watch keeps good time.

Historical and Technical References

The practice of adjusting banking pins is rooted in traditional watchmaking. Here are a few historical and technical insights that shed light on this procedure:

- **Antique Watch Factory Adjustments:** In the late 1800s and early 1900s, watch companies like Waltham, Elgin, and Swiss makers employed specialists to perform **escapement matching**. Every watch's escapement was fine-tuned: the pallet jewels were set in shellac for correct lock/drop, and the banking pins were adjusted for proper run-to-banking. Once set, these adjustments were meant to be permanent for that movement. Watches were serialized, and ideally parts (escape wheel, pallet fork, balance) stayed together. If parts were later swapped or a pallet jewel replaced, a watchmaker would need to redo some of this adjustment.
- **Henry B. Fried's Advice:** Henry B. Fried, a renowned mid-20th-century horologist, cautioned about fiddling with banking pins. In *The Watch Repairer's Manual*, he notes that **only a knowledgeable watchmaker** should adjust them, and only when necessary. He observed that many tinkerers mis-adjust pins in an attempt to fix problems, often

leading to “undesirable results”. Fried emphasizes that in a well-made watch, the **pallet stones and pins were set at the factory** and should not be altered unless some component has changed or there is clear evidence they’re wrong. This doesn’t mean you never adjust pins (even Fried describes how in context of repairing pallet jewels), but it underscores doing it carefully and knowledgeably.

- **Watchmaking School Curriculum:** Up until the mid-20th century, adjusting escapements (including banking pins) was a standard part of watchmaker training. For example, the Elgin Watchmakers College and WOSTEP courses taught students how to set lock, drop, and guard pin clearance by adjusting both pallet stones and banking pins. Today, because most modern watches have fixed bankings and use precise manufacturing, escapement adjustment is less common. But for vintage pieces, these skills remain relevant. The fact that the Swiss even have tools for bending non-adjustable banking pins shows that escapement adjustment is still sometimes done where needed.
- **Manufacturers’ Service Manuals:** If you happen to find a factory service manual (for instance, Hamilton or Waltham distributed some guidelines), they often instruct watchmakers to **check the escapement locks and safety** after any major repair. They might say to adjust the banking pins if the watch is “**knocking the banking**” (over-rotating) or if the lock is not in the acceptable range. For example, Hamilton materials might mention adjusting banking pins on certain 992B watches if guard pin clearance isn’t right.

In essence, adjusting banking pins is an old-school watchmaker task that connects us to the traditional craft of escapement adjusting. By studying the old literature and combining it with modern understanding (and perhaps timing machines), one can achieve a result that meets both historical standards and today’s expectations for performance.

Conclusion

Adjusting bendable banking pins in antique lever escapements is a delicate balancing act, but with patience and attention, it’s very rewarding. To recap, we identify the two small steel pins that limit the pallet fork’s travel and use fine tools under magnification to **nudge them** until the escapement locks and unlocks just right. We ensure that changing these pins’ positions yields a positive effect on how the pallet stones engage the escape wheel (secure lock with minimal drag) and that the **safety action** is preserved (preventing overbanking and stoppages). We used step-by-step instructions to carefully make these adjustments, emphasizing tiny changes and immediate testing.

For a traditional American or Swiss pocket watch from the 1800s or early 1900s, these techniques would be very much “by the book” – the same methods a watchmaker a century ago would use, albeit they might also adjust pallet jewels if needed. Remember the key points: **short, equal locks, just enough run, centered beat, and proper guard pin clearance**. Watch for signs like irregular ticks or stopping, which tell you to refine the settings. And always handle those century-old parts with respect; they can be surprisingly hardy (those pins are “hearty” but also unforgiving if pushed too far).

With the banking pins optimally positioned, your pocket watch's lever escapement should perform well – ticking steadily, resisting shocks, and giving consistent impulses to the balance. This not only improves timekeeping but also reduces wear (an escapement that's not slamming or slipping will last longer). It is indeed a satisfying feeling to see a once-problematic watch now “keeping good time and tying every bundle” (as one might say) after such adjustments.

In summary, use a careful, knowledgeable approach: the **practical watchmaker techniques** of gentle bending, observing with a loupe, listening to the tick, and iterating adjustments. By doing so, you uphold a long tradition of fine watch adjustment and ensure these marvelous old timepieces continue to run safely and accurately for years to come.