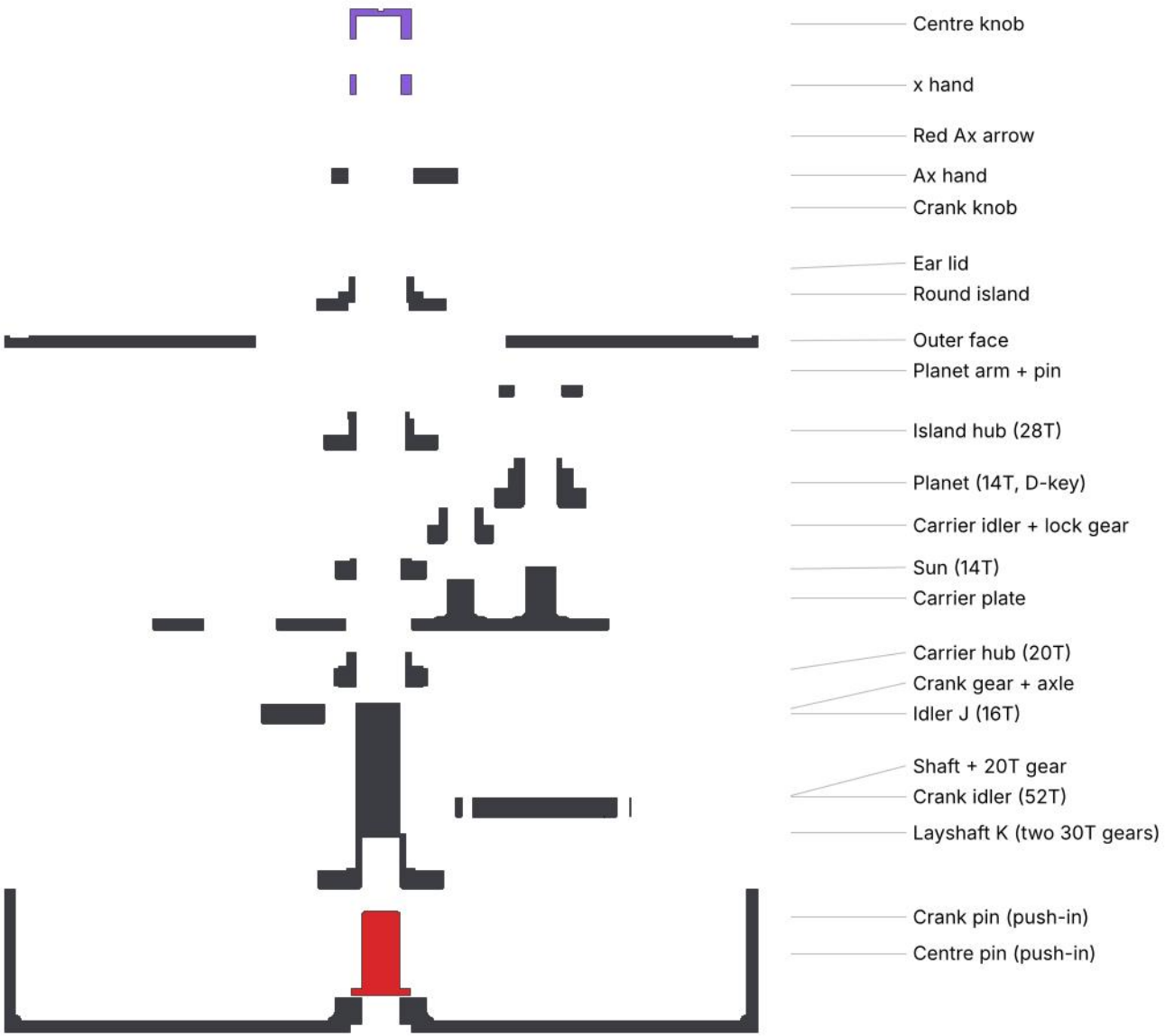
Eigenvector Clock v3 - assembly guide

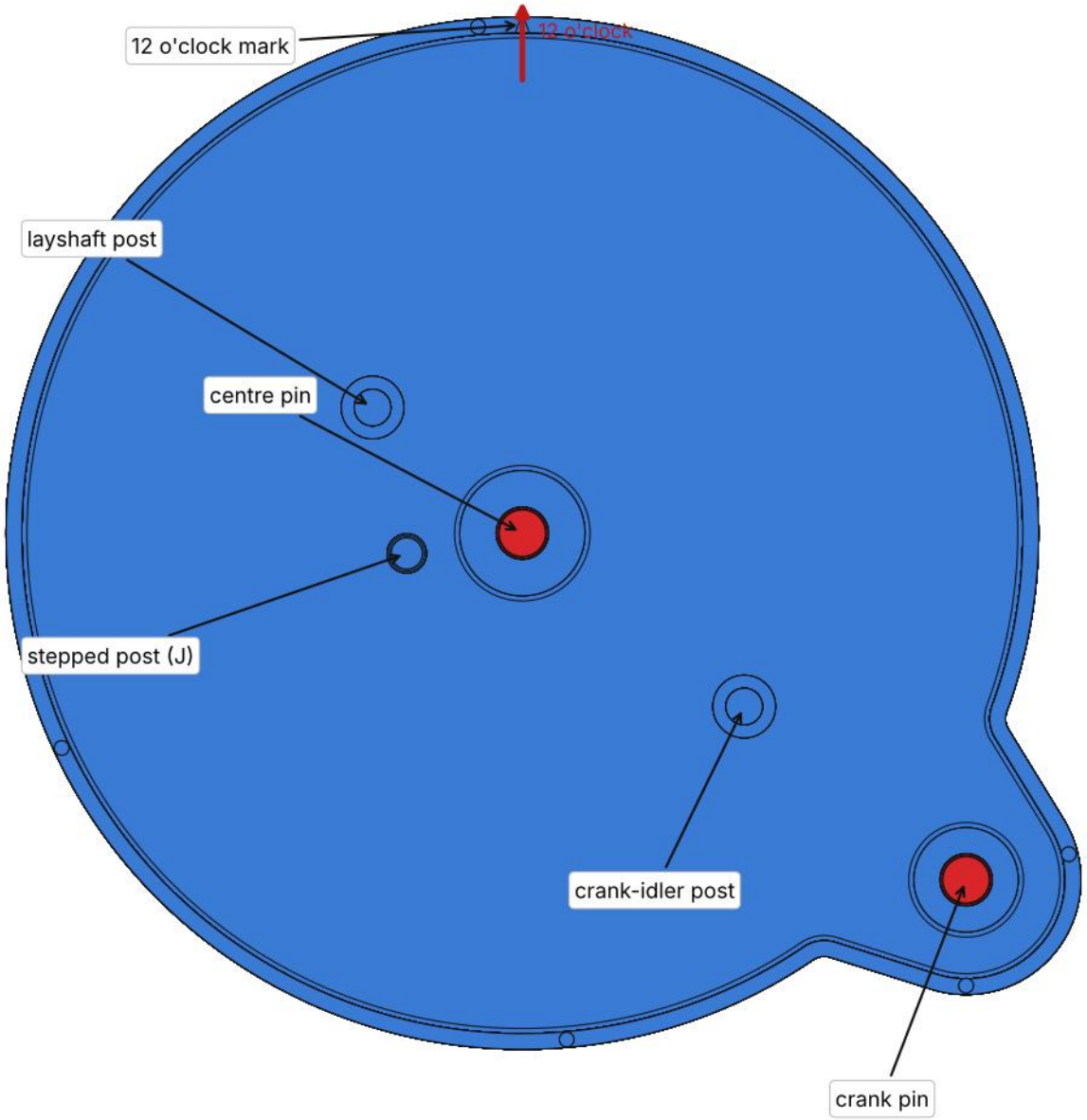
Assemble with the base flat, viewed from above. Set the shaft arrow to 12 o'clock first; every later arrow and flat refers to that pose.

Exploded side cut, bottom to top in assembly order (set S shown)

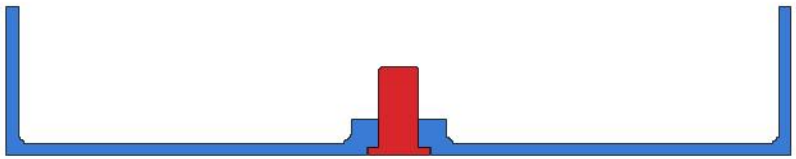


Step 1. Push-in pins

Turn the base over. Press the two identical pins up through the holes at the centre and in the crank ear until their heads sit flush in the recesses underneath. Turn the base back over: each pin now stands about 13 mm proud of its boss. The arrow on the wall top marks 12 o'clock. If a pin is too tight, sand the shank lightly; it should need a firm push, not a hammer.



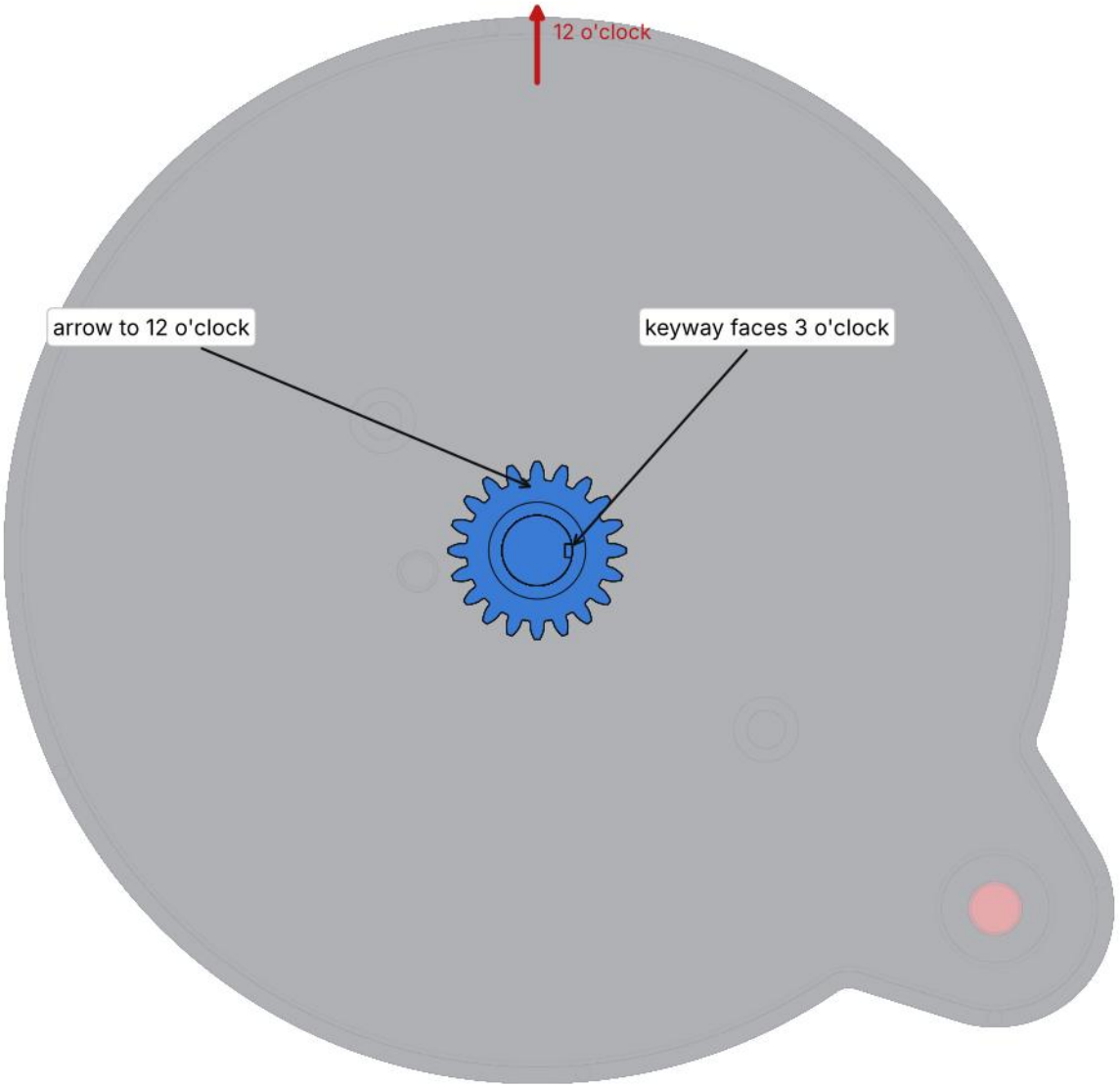
side cut through the centre (left-right)



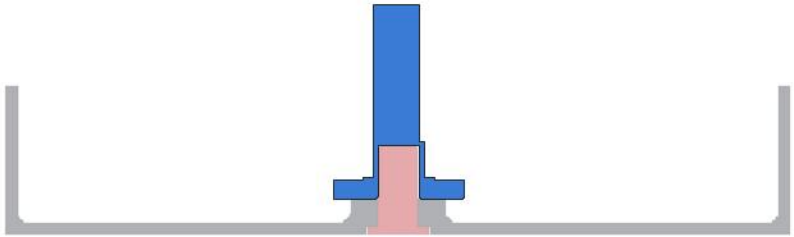
Coloured = parts added in this step
Grey = already installed

Step 2. Shaft

Lower the shaft over the centre pin, gear down, until the gear rests on the boss. Turn it so the small arrow on the gear points to 12 o'clock; the keyway groove then faces 3 o'clock. Keep it there until the island hub is on.



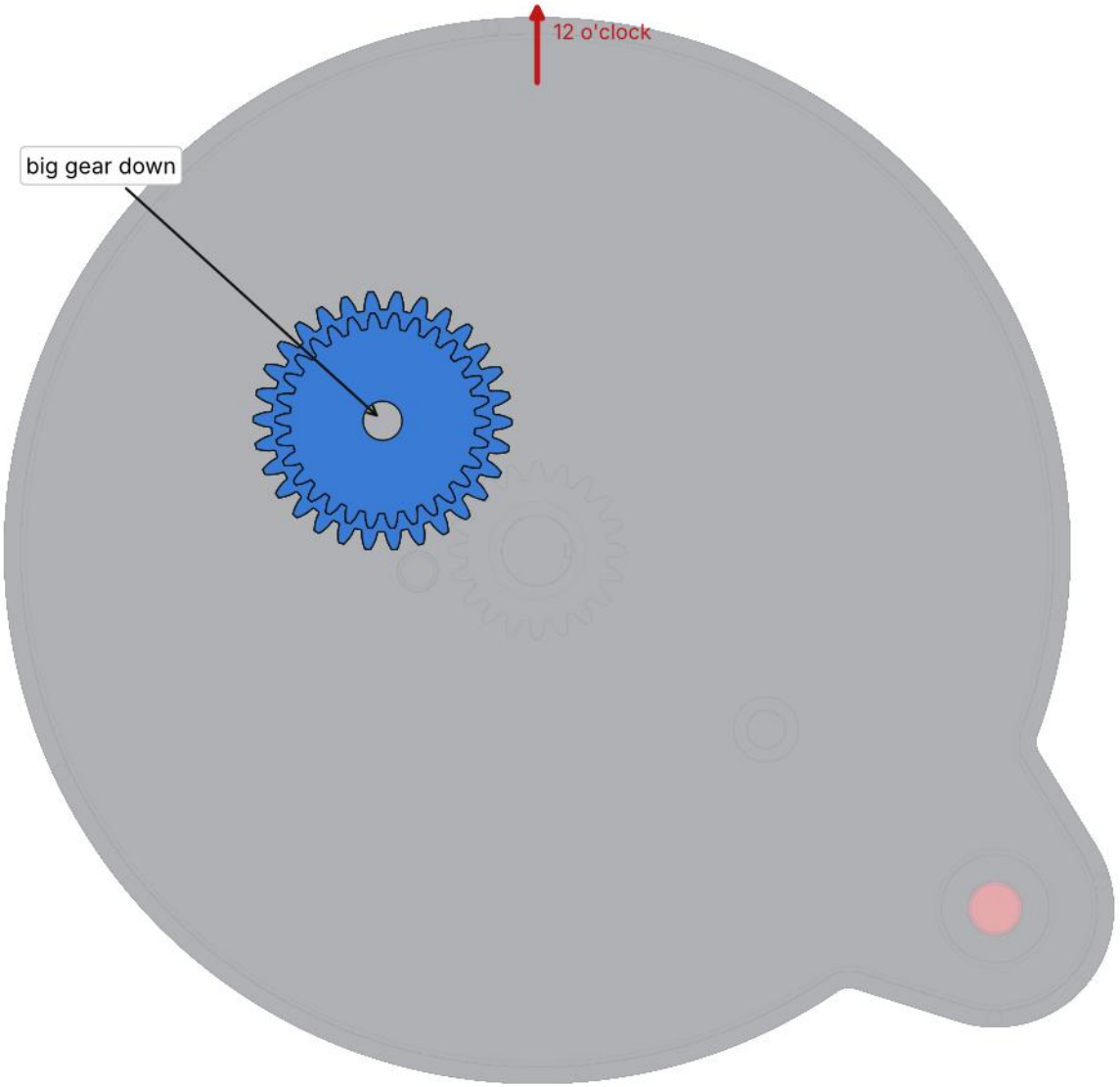
side cut through the centre (left-right)



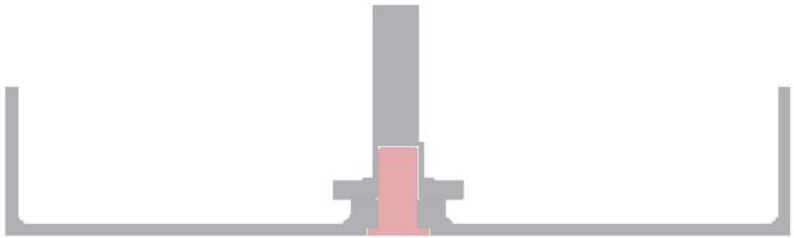
Coloured = parts added in this step
Grey = already installed

Step 3. Layshaft K

Drop the layshaft on its post, bigger gear down. Any orientation; it meshes the shaft gear.



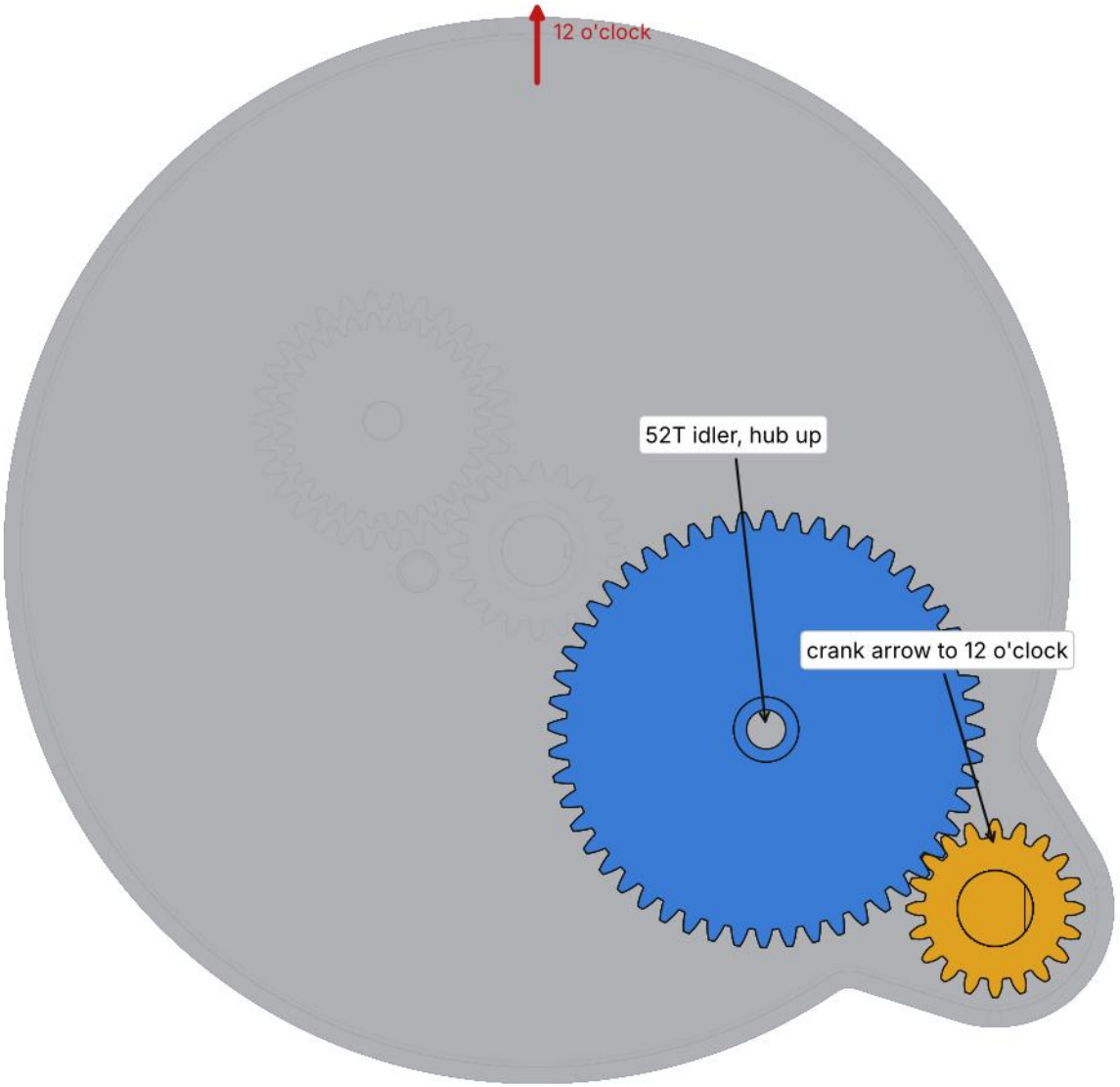
side cut through the centre (left-right)

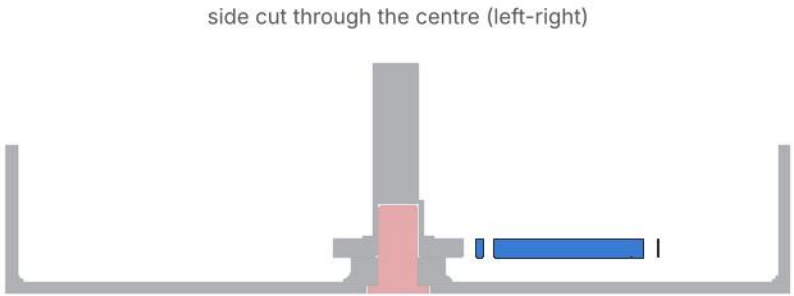


Coloured = parts added in this step
Grey = already installed

Step 4. Crank idler and crank gear

Put the 52-tooth crank idler on its post (hub up, any orientation). Lower the crank gear over the crank pin, axle up, with its arrow pointing to 12 o'clock. Check: turning the shaft turns the crank the same way.

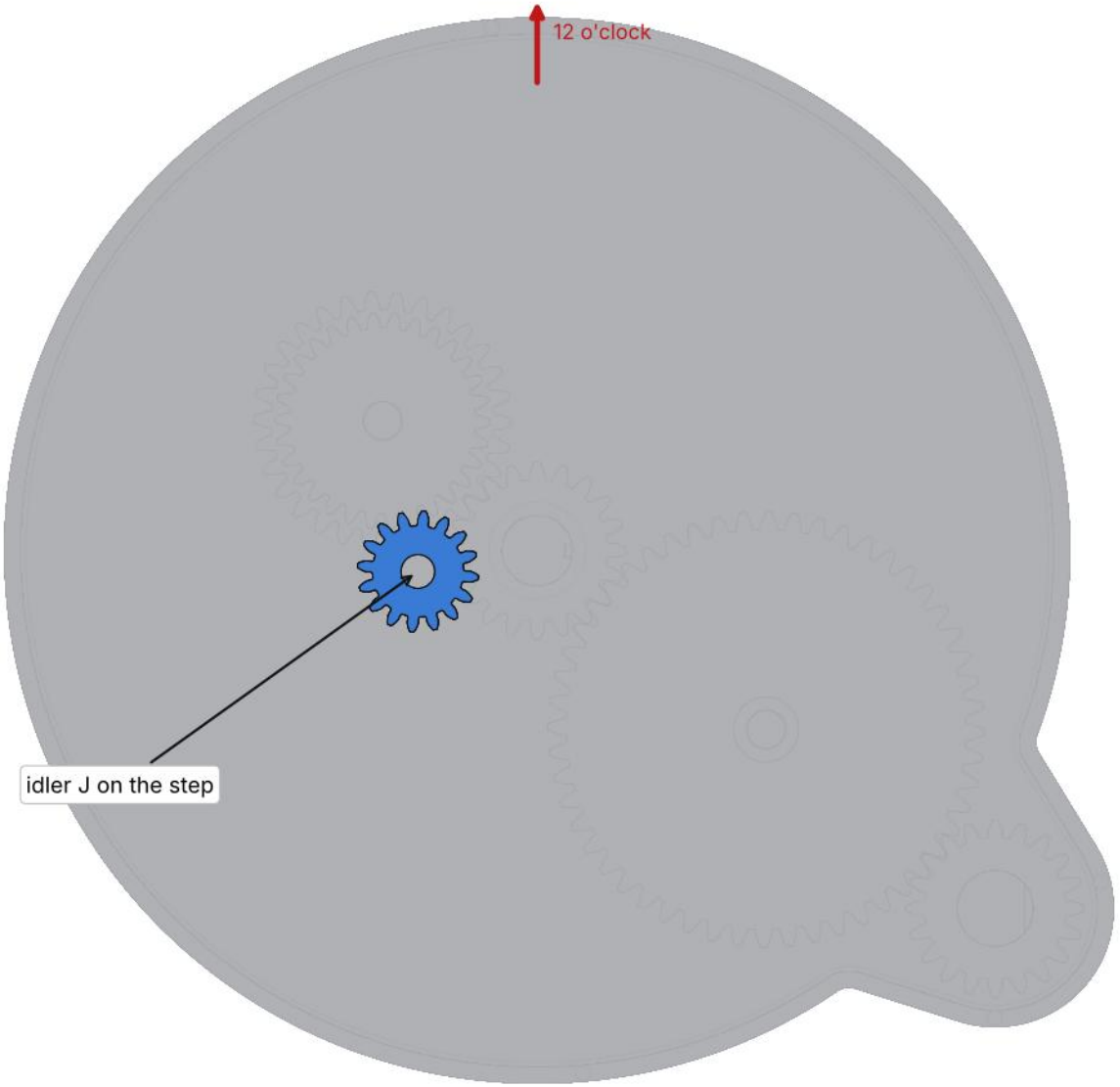




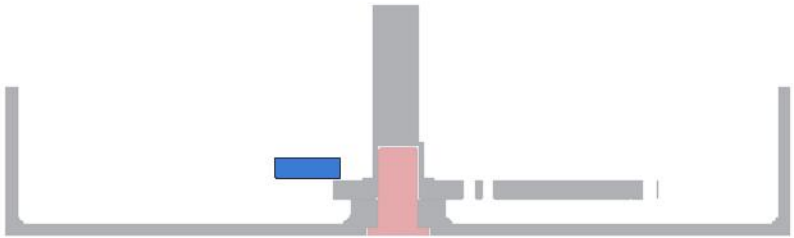
Coloured = parts added in this step
Grey = already installed

Step 5. Idler J

Lower the 16-tooth idler J onto the stepped post and rotate it gently until it drops onto the step, meshing the upper gear of K.



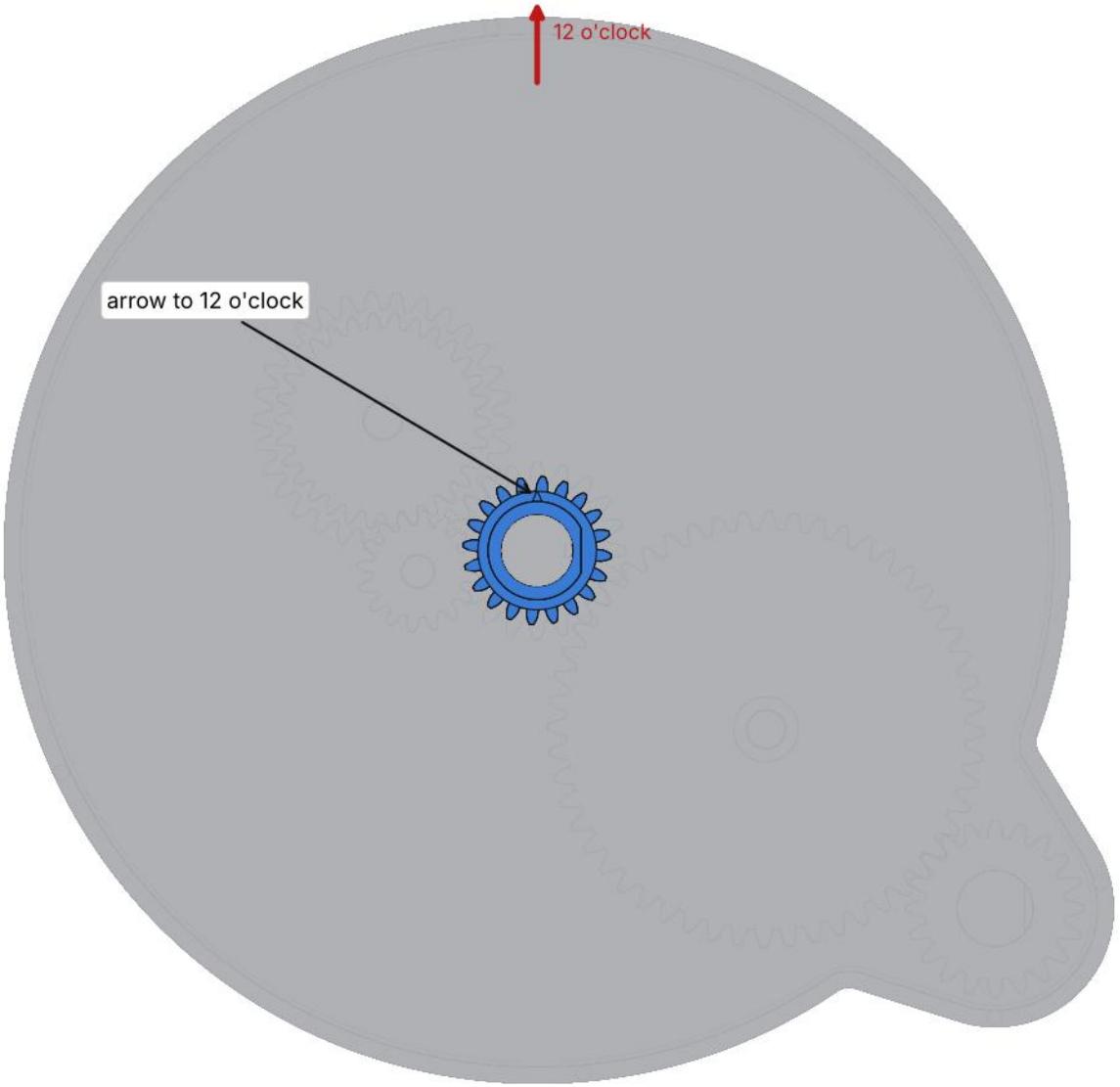
side cut through the centre (left-right)



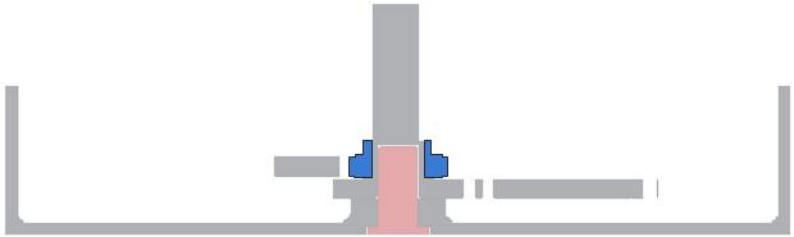
Coloured = parts added in this step
Grey = already installed

Step 6. Carrier hub

Lower the carrier hub over the shaft with its arrow at 12 o'clock (its flat faces 3 o'clock). It meshes idler J. If it will not drop in, recheck the shaft arrow rather than forcing it.



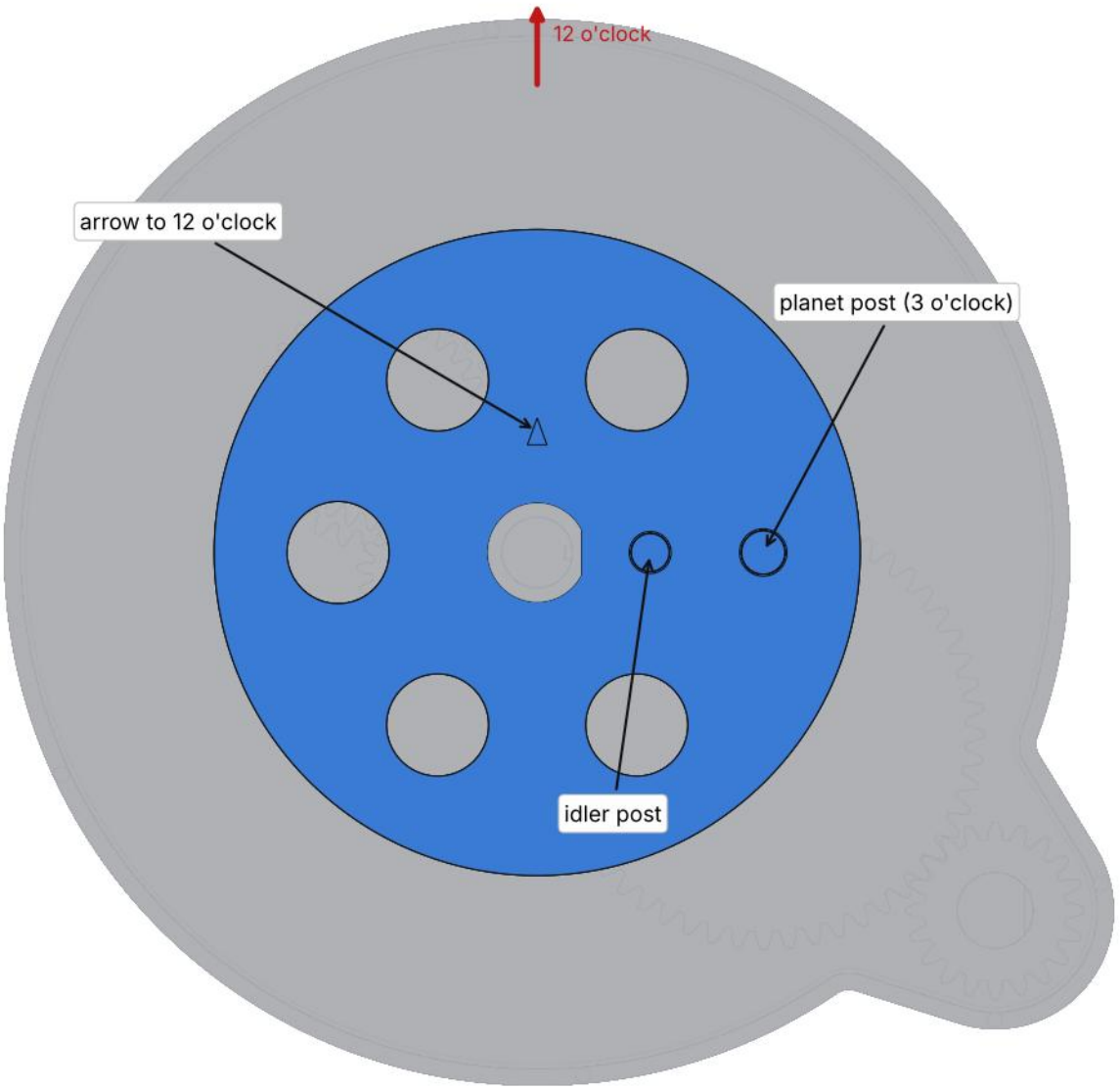
side cut through the centre (left-right)



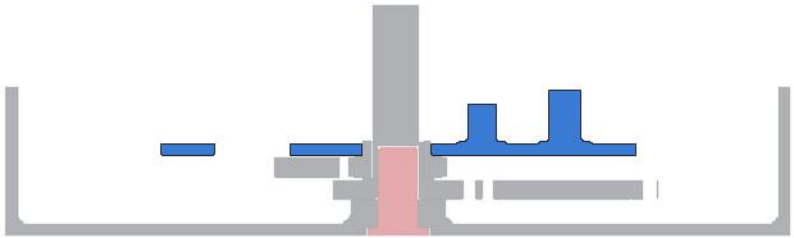
Coloured = parts added in this step
Grey = already installed

Step 7. Carrier plate

Press the plate onto the hub's flat-sided tube (fits one way): big arrow to 12 o'clock, the two posts toward 3 o'clock. Check: turning the shaft turns the plate the opposite way at the same speed.



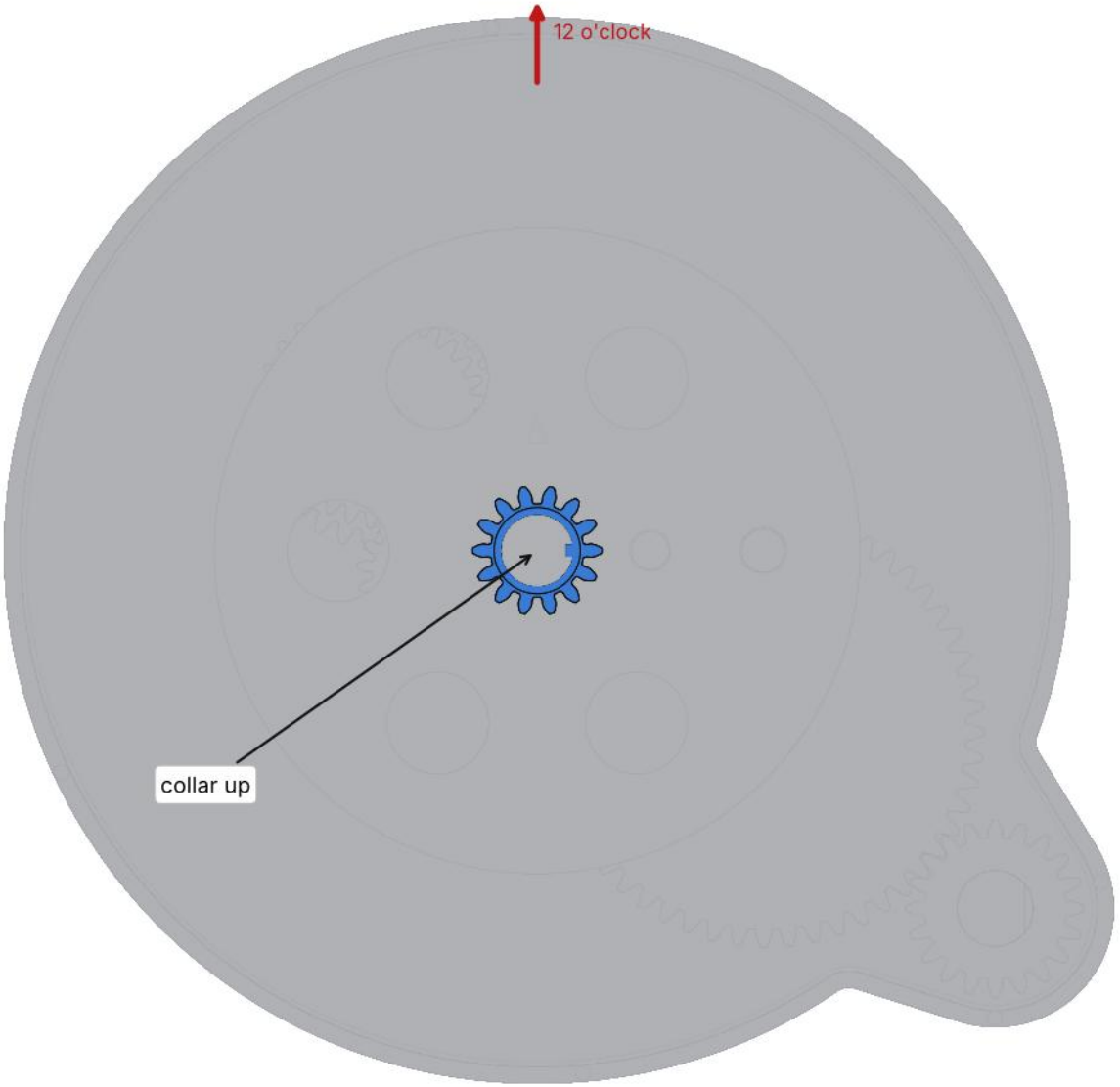
side cut through the centre (left-right)



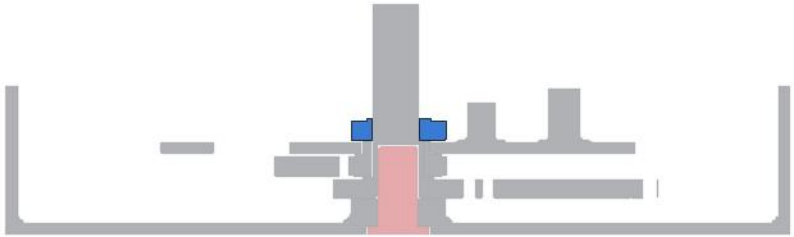
Coloured = parts added in this step
Grey = already installed

Step 8. Sun

Slide the sun down the shaft, collar up. The tab in its bore rides in the shaft's keyway, so it only fits one way.



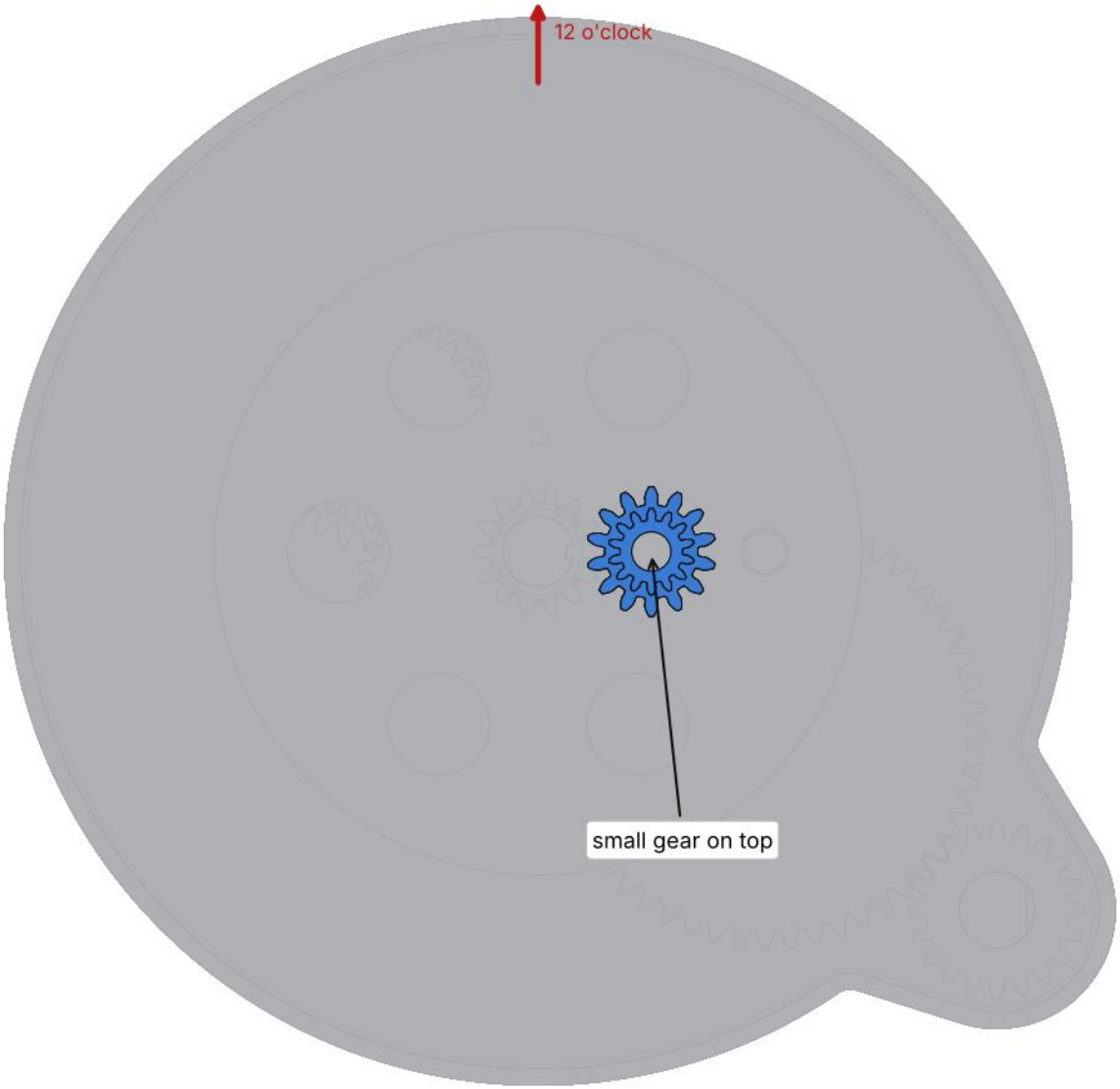
side cut through the centre (left-right)



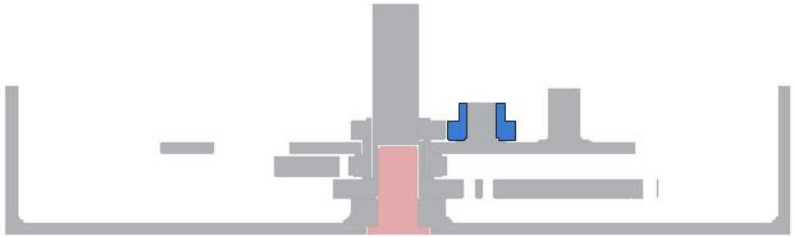
Coloured = parts added in this step
Grey = already installed

Step 9. Carrier idler + lock gear

Put the two-level idler on the inner carrier post, small gear on top. Any orientation; it meshes the sun.



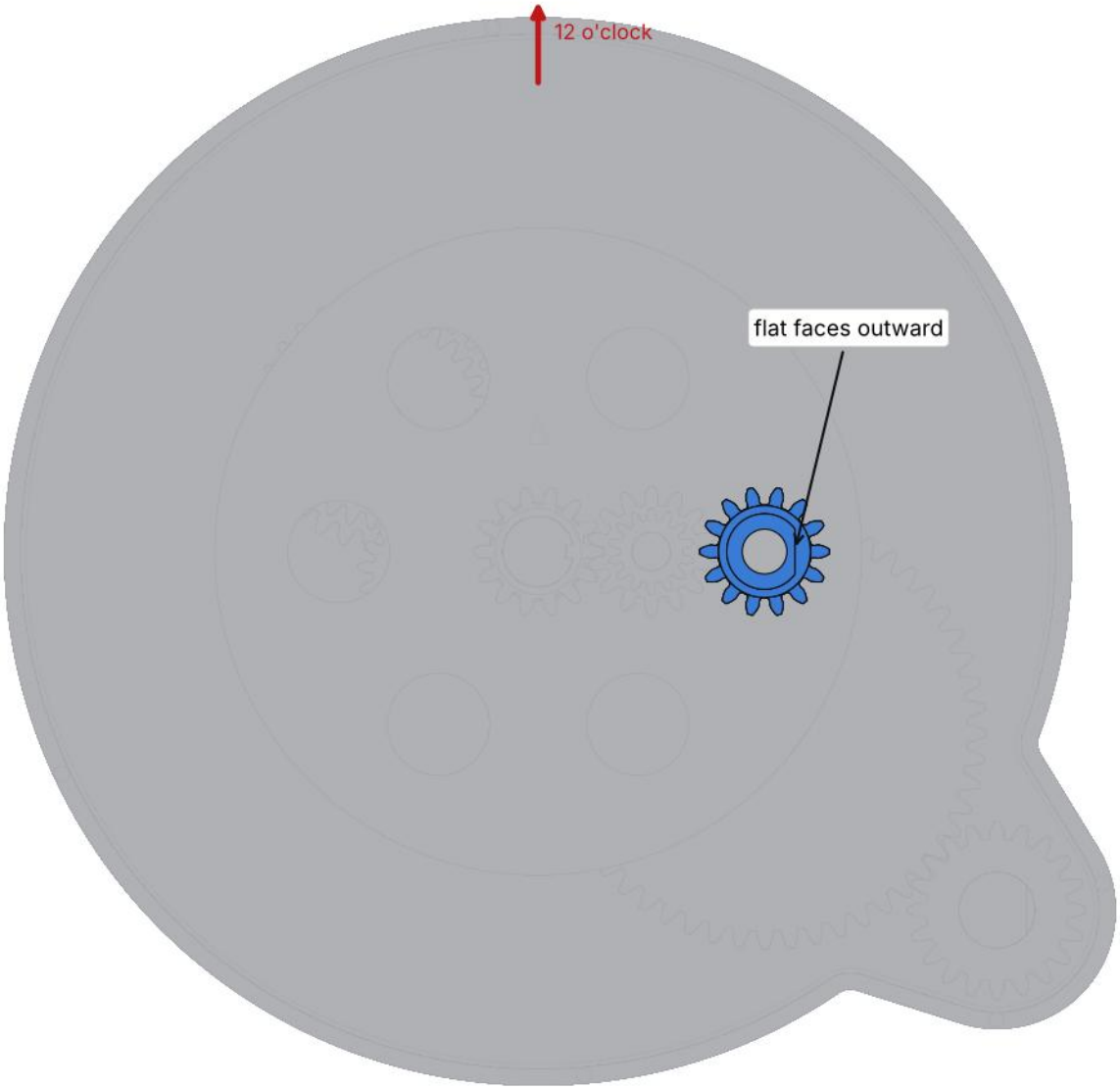
side cut through the centre (left-right)



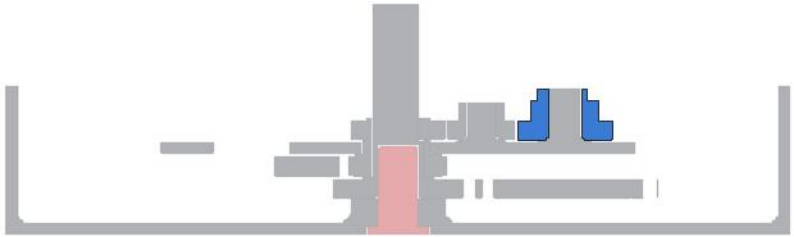
Coloured = parts added in this step
Grey = already installed

Step 10. Planet

Put the planet on the outer post with the flat of its key facing outward (3 o'clock). This sets the arm timing.



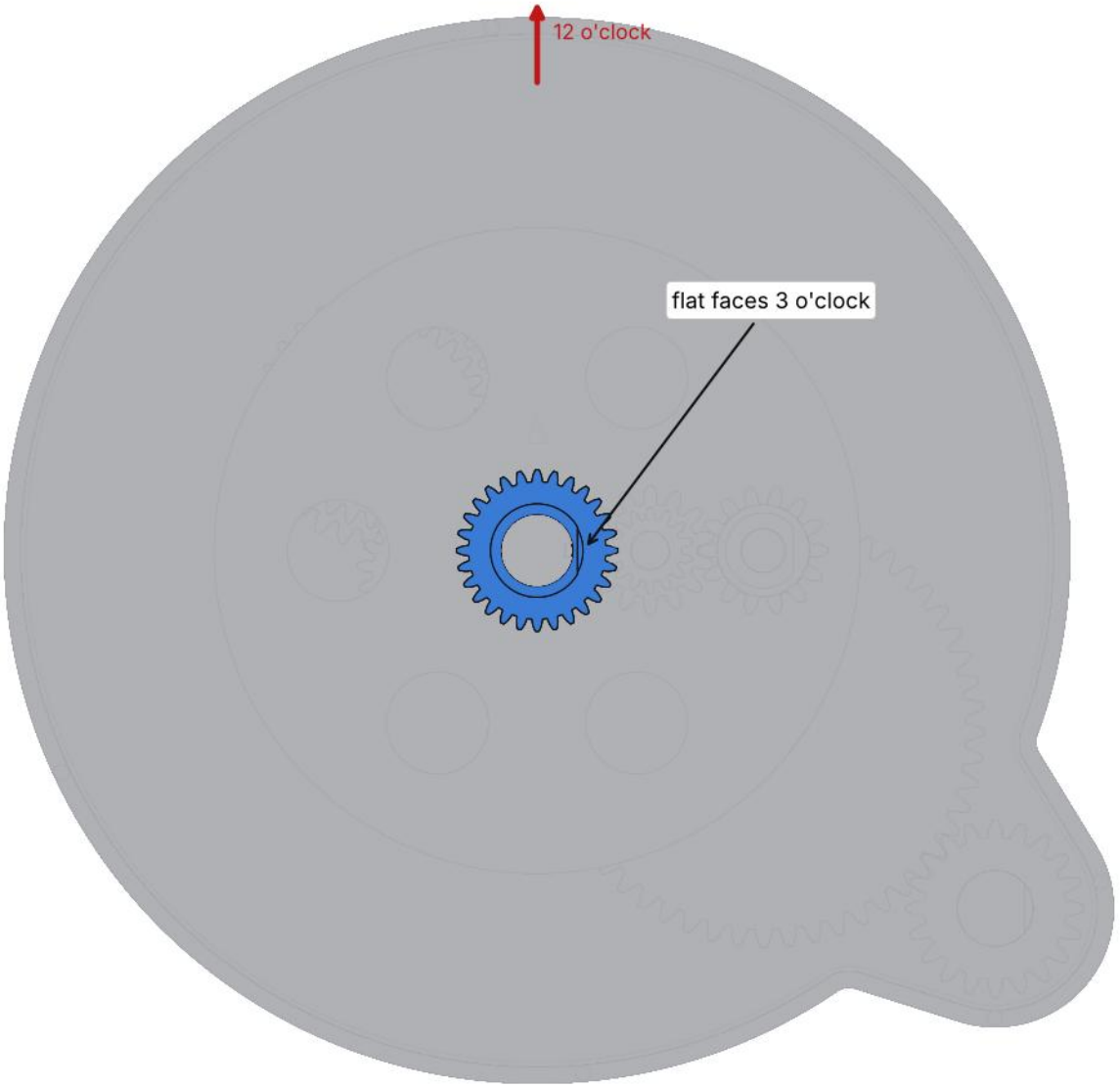
side cut through the centre (left-right)



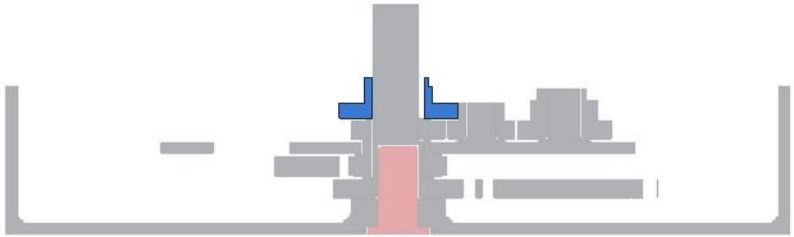
Coloured = parts added in this step
Grey = already installed

Step 11. Island hub

Lower the island hub over the shaft, flat facing 3 o'clock; it meshes the small idler gear. Check: turn the shaft a full turn. The island hub must stay still while the planet turns with the shaft.



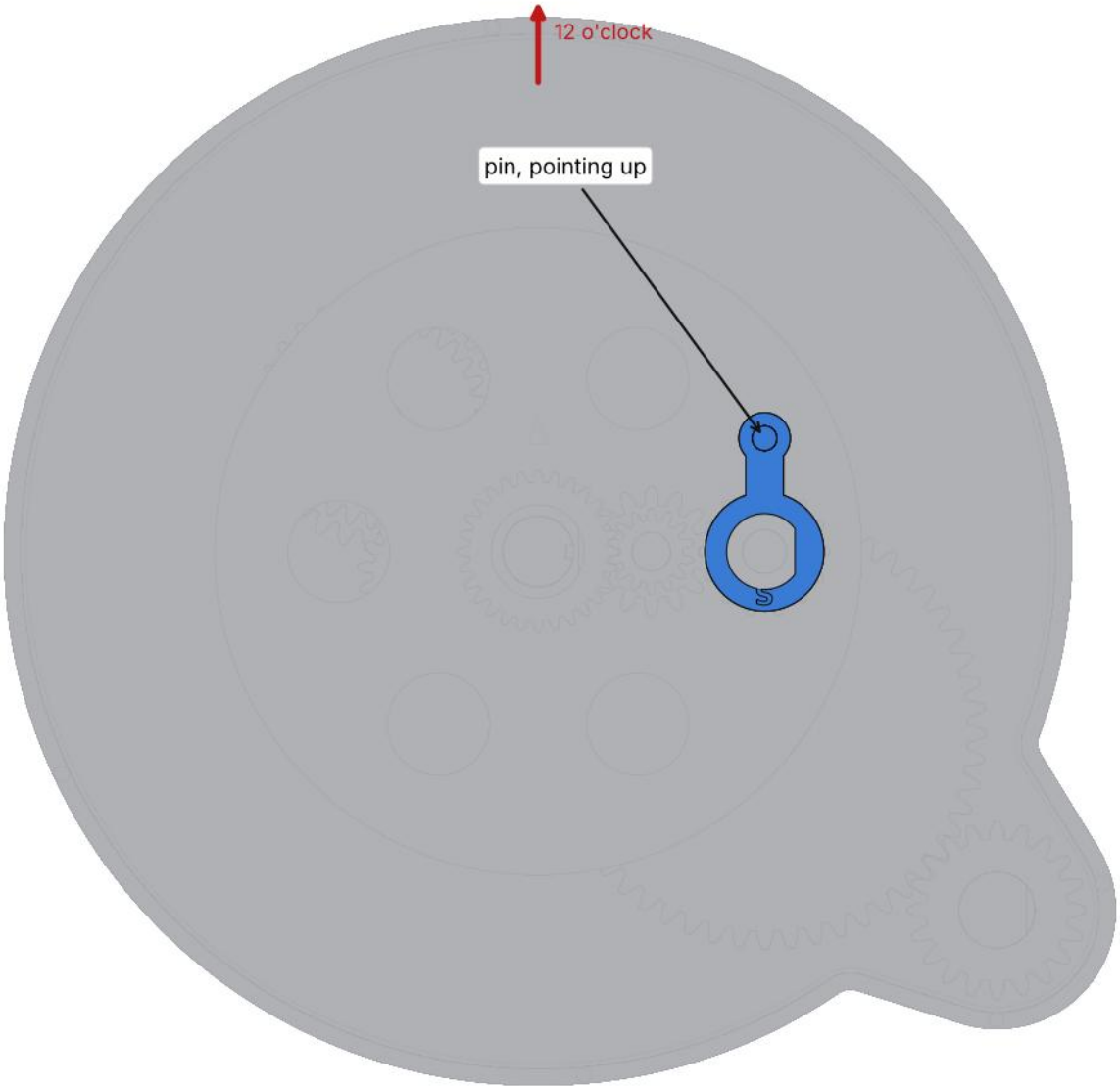
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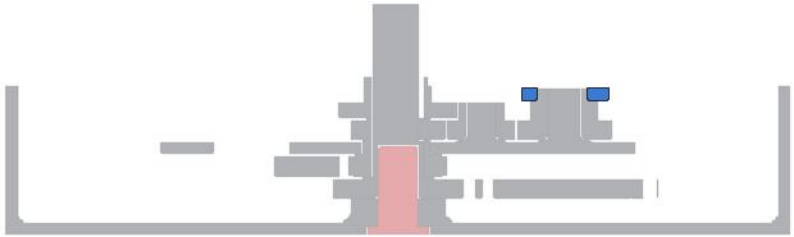
Coloured = parts added in this step
Grey = already installed

Step 12. Planet arm (S shown)

Press the arm onto the planet key (fits one way), pin up. Each set has its own arm, lettered D, S or N.



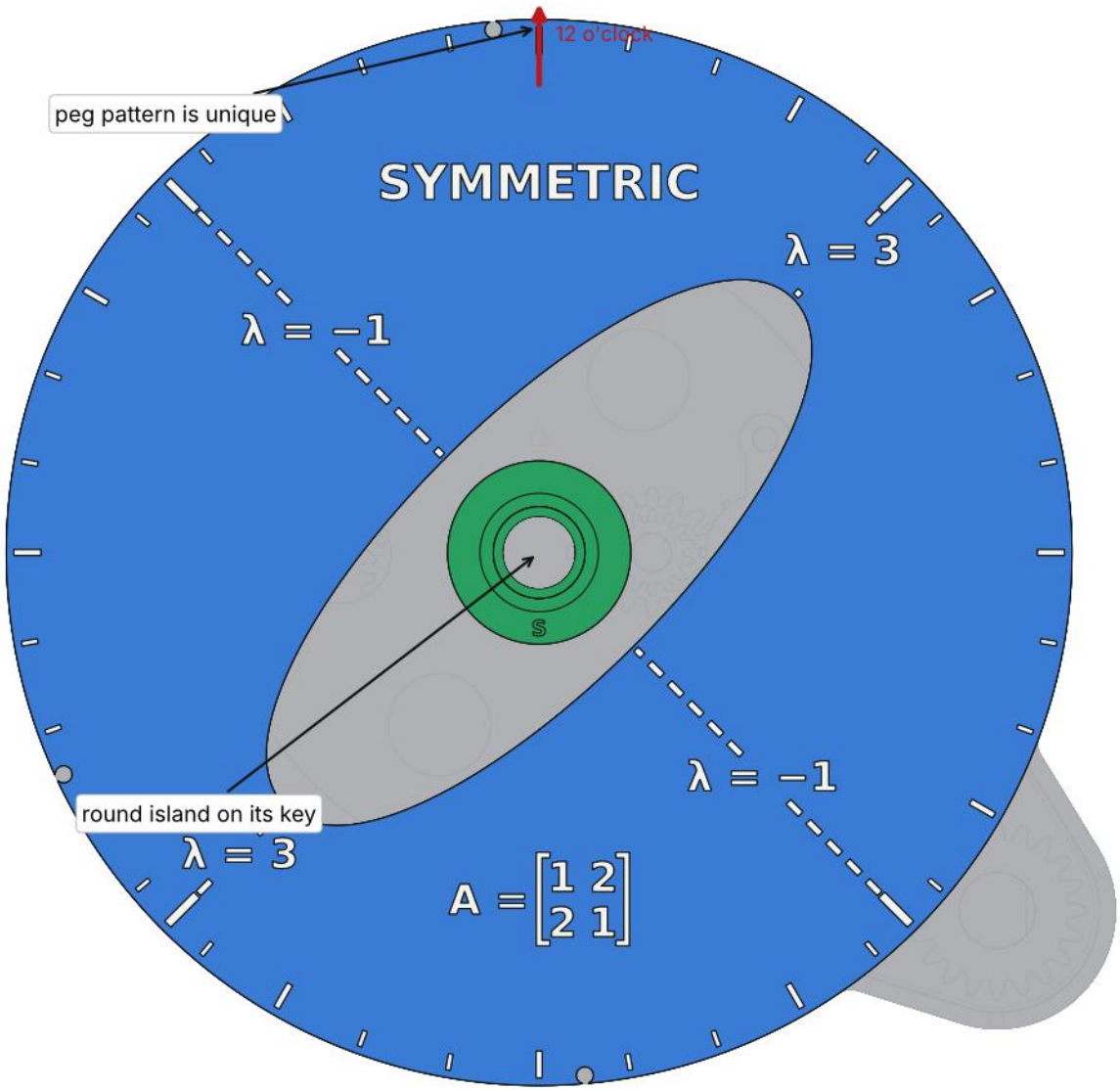
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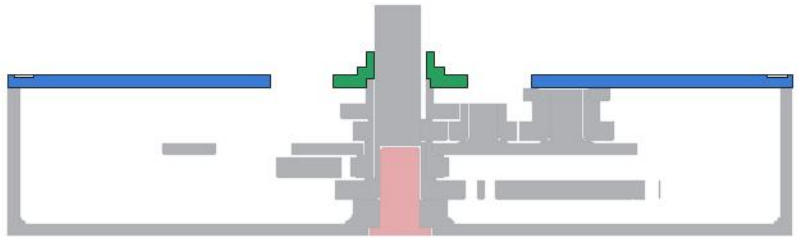
Coloured = parts added in this step
Grey = already installed

Step 13. Outer face and round island

Set the outer face on the three wall pegs (fits one way) with the pin poking up through the cut-out. Press the round island (lettered on top) onto the hub's flat key until it sits flat.



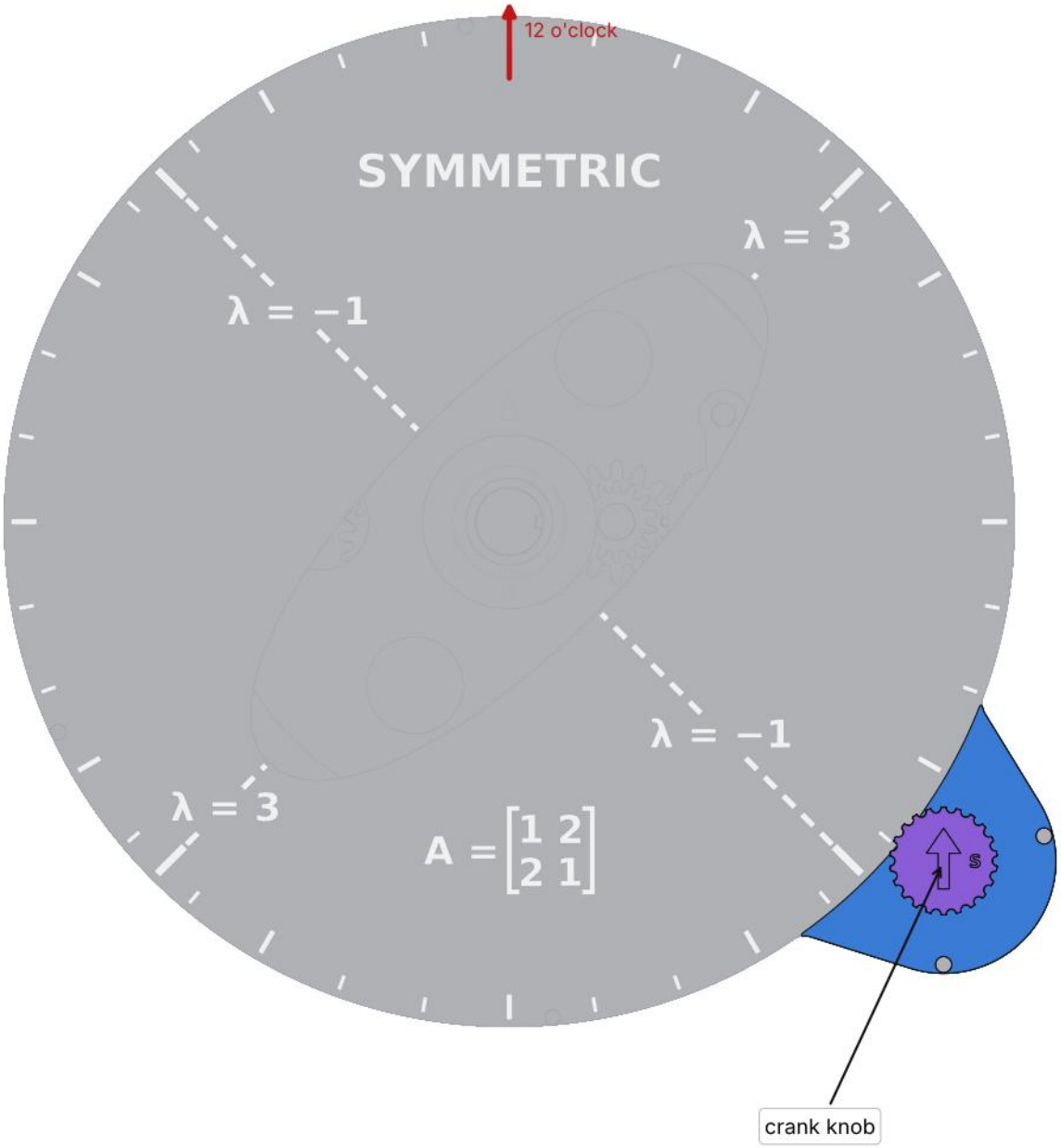
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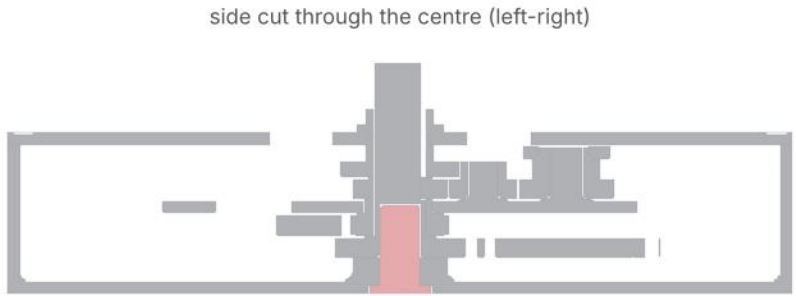


Coloured = parts added in this step
Grey = already installed

Step 14. Ear lid and crank knob

Press the ear lid onto its two pegs; the crank axle passes through its bearing hole. Press the crank knob onto the axle's flat. The knob's arrow stays parallel to x.

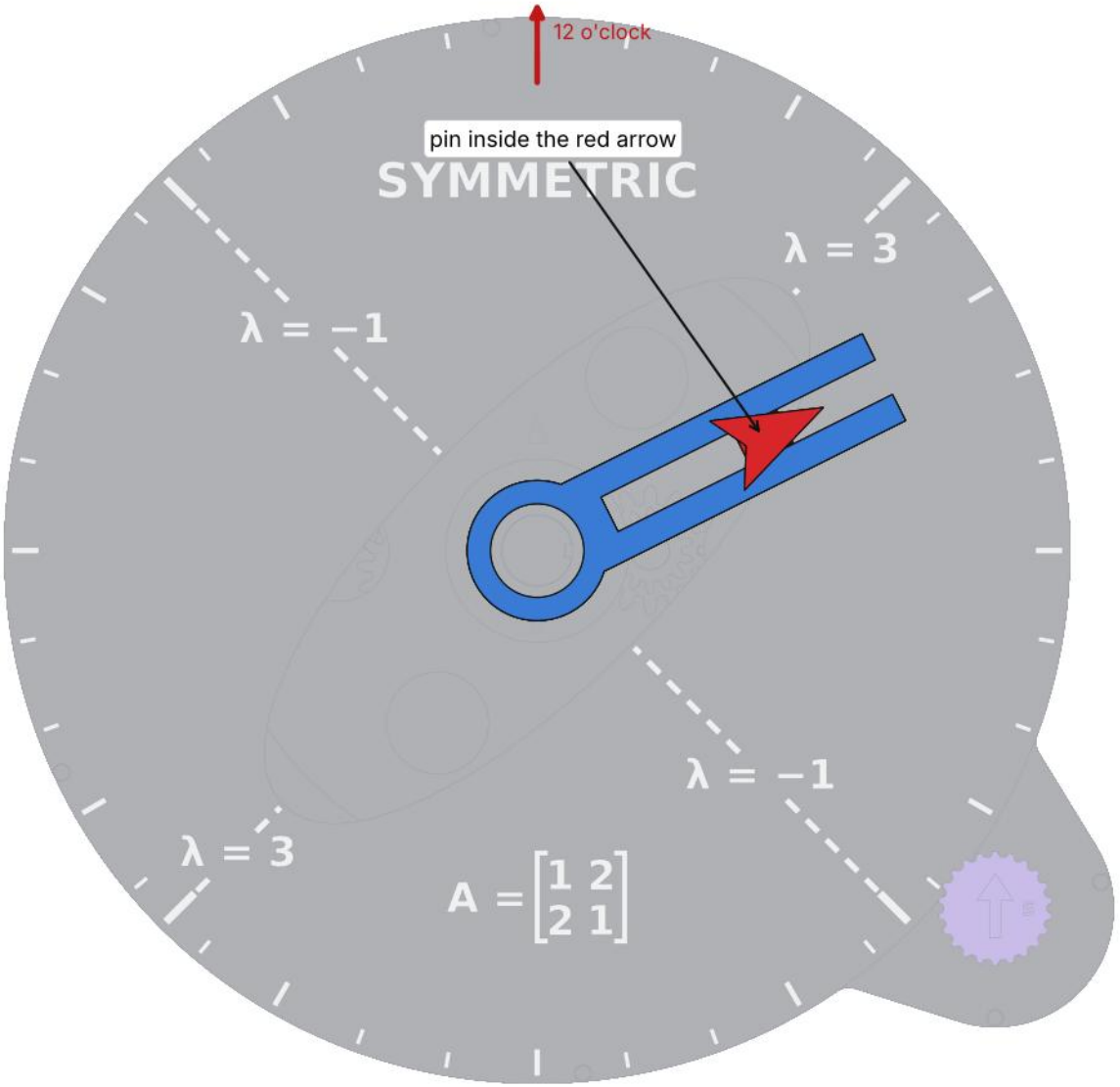




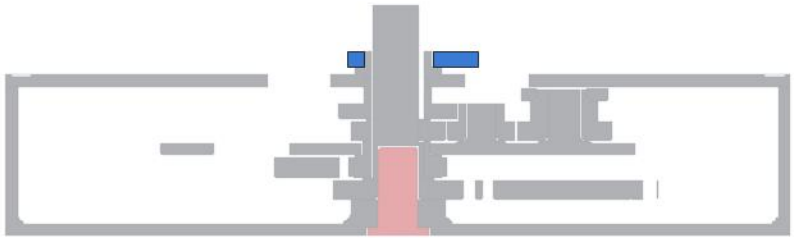
Coloured = parts added in this step
Grey = already installed

Step 15. Ax hand and red arrow

Slide the red arrow into the track under the Ax hand from its open tip, point outward. Lower the hand over the island boss and guide the pin up into the arrow (slide the arrow along the track until it drops onto the pin).



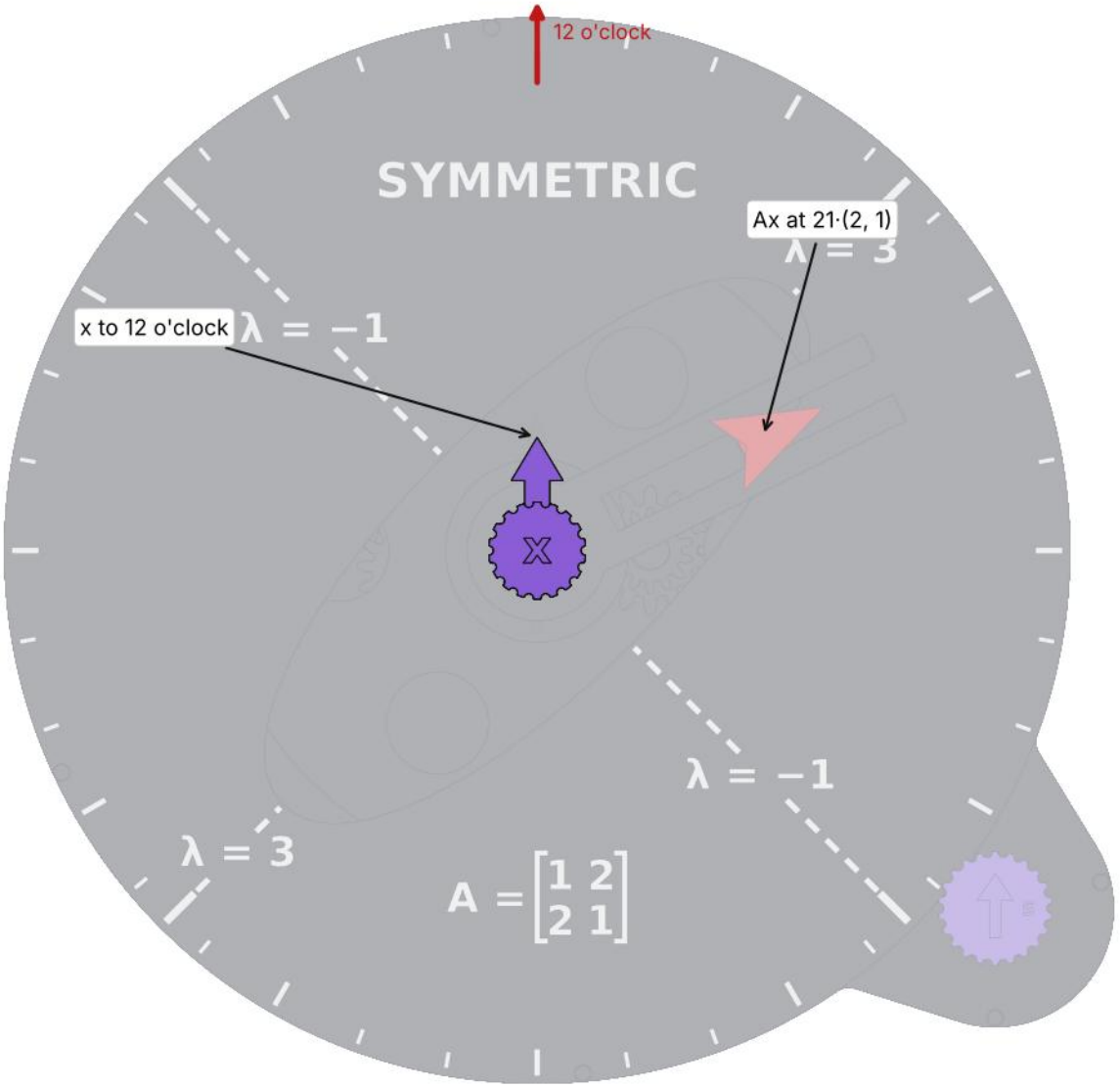
side cut through the centre (left-right)



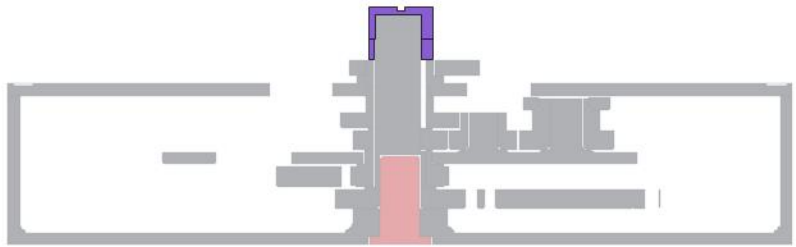
Coloured = parts added in this step
Grey = already installed

Step 16. x hand and centre knob

Press the x hand onto the top of the shaft (its tab finds the keyway), then the centre knob. Check (S set): x points to 12 o'clock and the red arrow sits at 21·(2, 1) mm. Turn the crank: when the arrow sits on the line of x, x is an eigenvector.



side cut through the centre (left-right)



Coloured = parts added in this step
Grey = already installed

Swapping matrix sets (D, S, N)

Each set is five printed pieces, all lettered: outer face, round island, planet arm, x hand, crank knob. Everything else stays in the clock.
1. Pull off the centre knob, then the x hand. 2. Lift the Ax hand (the red arrow stays in its track). 3. Lift the island and the outer face.
4. Pull the crank knob. 5. Lift the planet arm off the planet key. 6. Put on the new arm, outer face, island, Ax hand (pin into the arrow), x hand, centre knob and crank knob, all with the same letter. Every piece is keyed, so the gears can be at any angle: no re-timing.

