

The Small Steam Yacht

**Steam yacht with diaphragm boiler and twin exhaust drive
Complete with rudder, water pipette, and fire spoon**

Please note: Nowadays tin toys are considered to be collector's items only, as their sharp edges can lead to injuries if not handled with care. The Small Steam Yacht is operated with an open flame, so there is the additional risk of fire and burns. This model is not a toy, but a physical demonstration model. It is suitable for children from the age of 14, only under adult supervision.

Instructions:

Step 1: Completely fill the boiler through one of the two drive pipes with water (until it comes out the other one). To do this, use the enclosed pipette or hold one of the tubes under running water.

Step 2: Put the boat on the water. Whilst doing this, cover the pipes with a finger so that no water leaks out. Set the rudder.

Step 3: Light the candle in the fire spoon and gently push it under the boiler. The spoon rests on the tubes, the handle on the edge of the boat. **Tip:** The yacht works better with the Steam Engine Fuel from AstroMedia (article No 501.DMT). It burns more reliably and hotter, it doesn't need a wick, and doesn't soot the boiler.

Step 4: Wait for the water in the boiler to boil. Once it is hot enough, some of it instantly turns into steam. Because steam has more than 1,600 times the volume of water, it drives the water out of the boiler and through the pipes with great force, thus producing a recoil that pushes the boat forwards. This process is repeated after a short time, then again, then faster and faster until the engine produces a rattling noise.

Question: Why doesn't the boat simply stop after the first recoil?

Answer: As soon as the steam reaches the cool exhaust tubes, it condenses into water and reduces its volume by the same factor of ca. 1,600. This causes fresh water to be drawn in and the process starts again.

Another question: Where does the rattling noise come from?

Answer: In the rapid exchange between ejection and intake of water, the diaphragm walls of the boiler are bent outwards and inwards, this creates the noise. Hence the nickname "Pop Pop Boat".

One last question: Why does the boat move at all, when exactly the same amount of water is expelled as is drawn in?

Answer: The water is ejected in only one direction, hence the recoil. Water is sucked back in from all directions and these cancel each other out.

Invitation to the Big Photo Regatta: Our pretty Steam Yacht is a perfect little model, whether silvery on a garden pond or colourfully painted in front of an exciting bathtub backdrop. If you want, send us your photo and we will publish it in our Steam Yacht Photo Gallery.

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