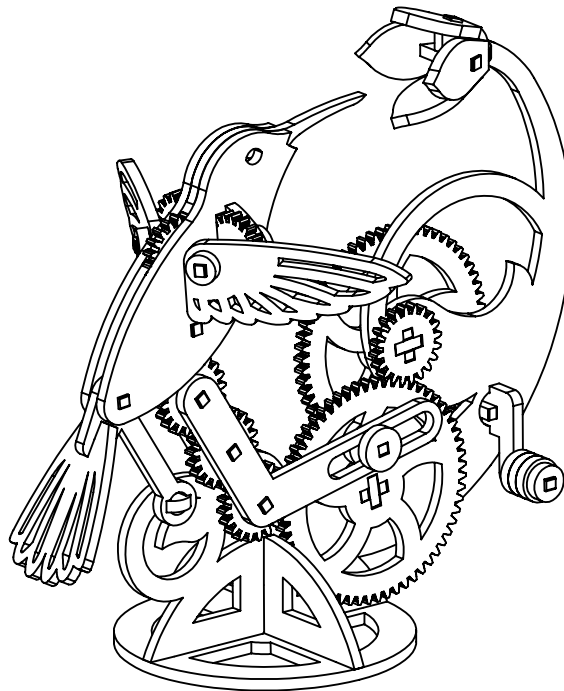


Hummingbird and Flower Automaton

by Shasa Bolton
www.ContraptionCart.com



I have found myself returning to hummingbirds quite a few times in my mechanical designs, and finally feel like I have come up with a simple way to achieve their elegant figure of 8 flap. I have not seen this bent shaft method used before so cannot give you a name for the mechanism. As usual, I try to make things as simple as possible but no simpler, in order to achieve the desired motion. If you get stuck feel free to contact me through the website above.

Laser cutting instructions

If you are laser cutting these parts yourself...

Files with "offset 0.08mm" in the name have had all part lines in/out offset to account for an 0.05mm laser kerf, plus and extra 0.03mm to assist press fits.

If your kerf is very different you may need remove this offset and apply your own.

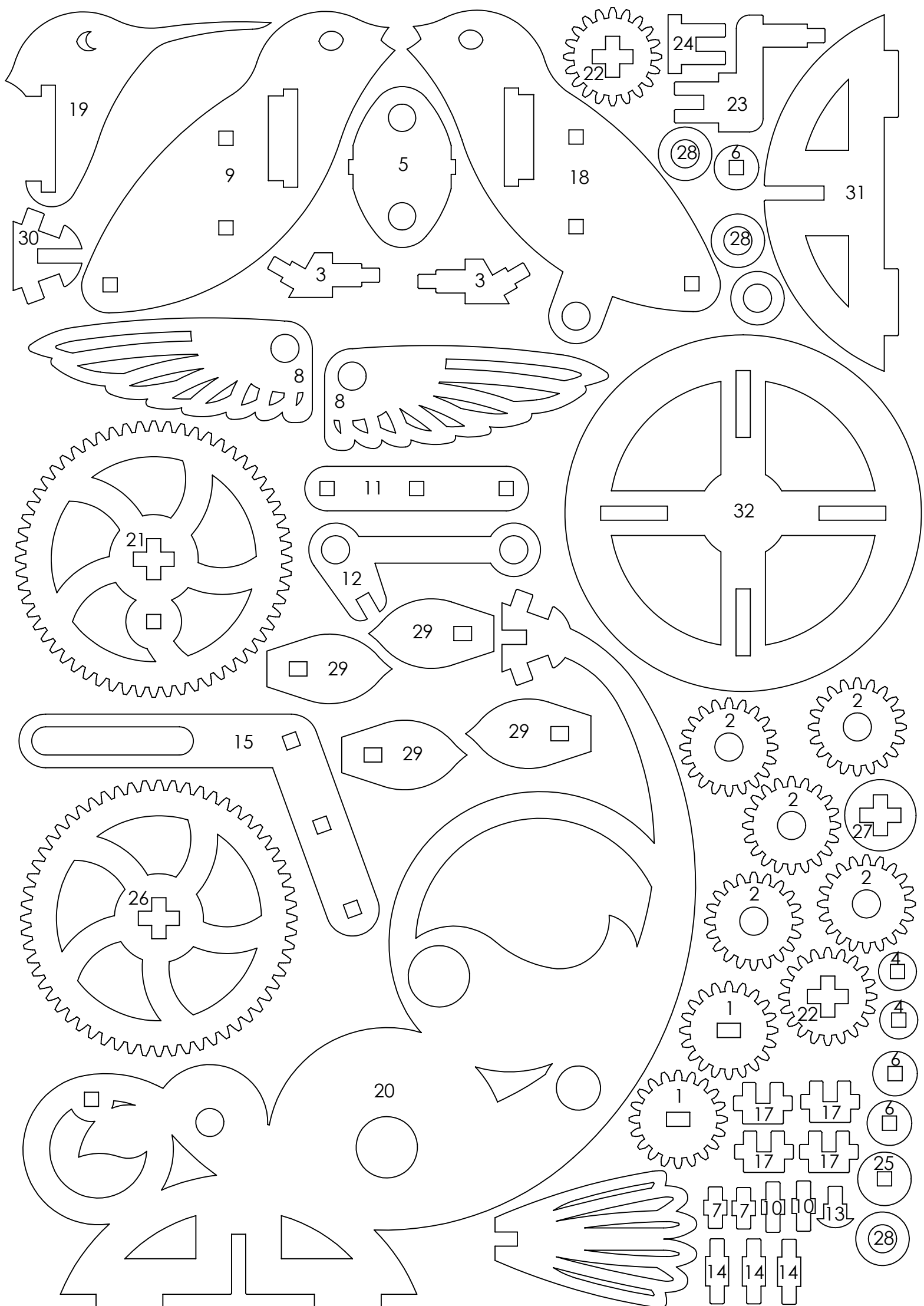
If you are scaling the file significantly you may also need to remove this offset before scaling and then reapply your own.

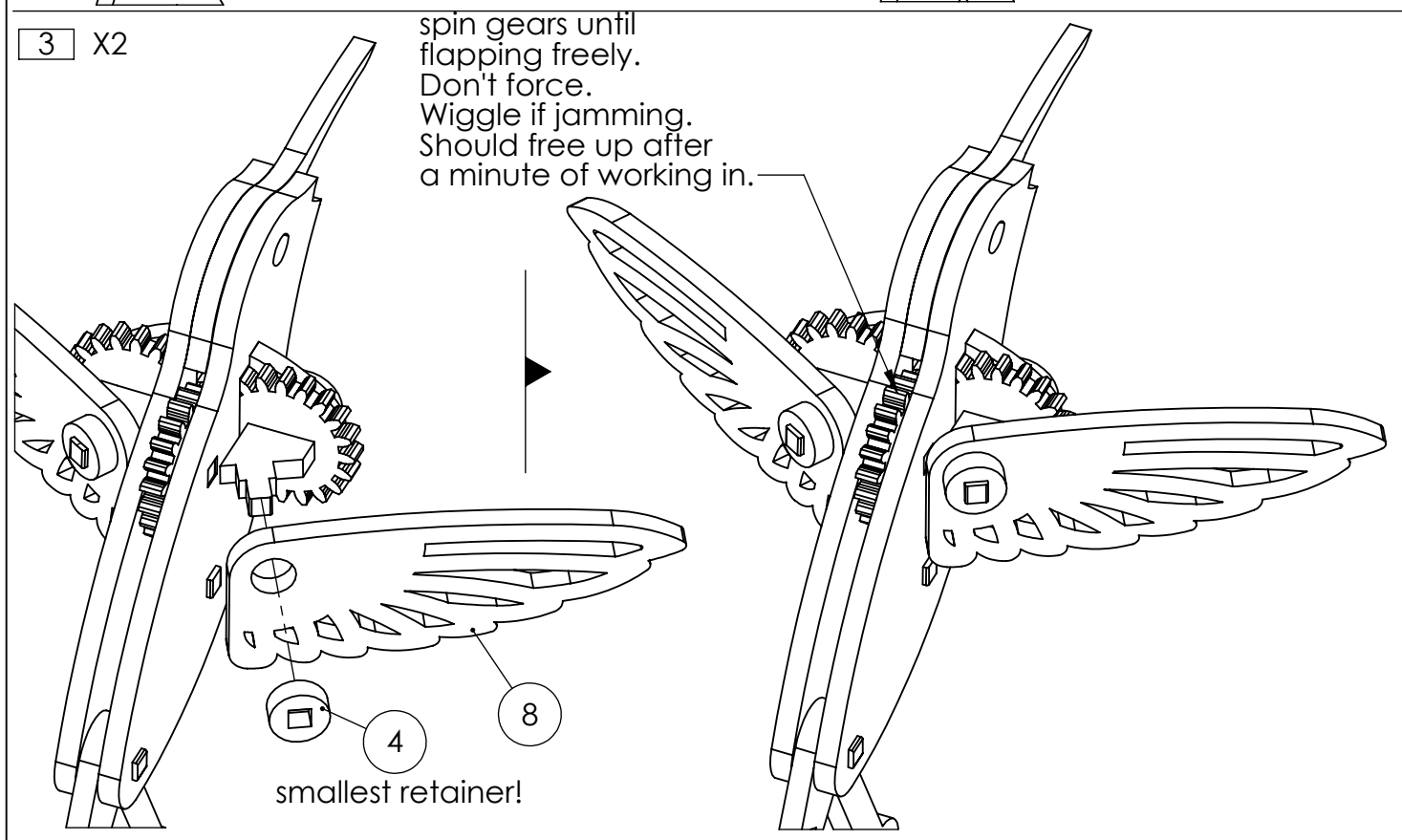
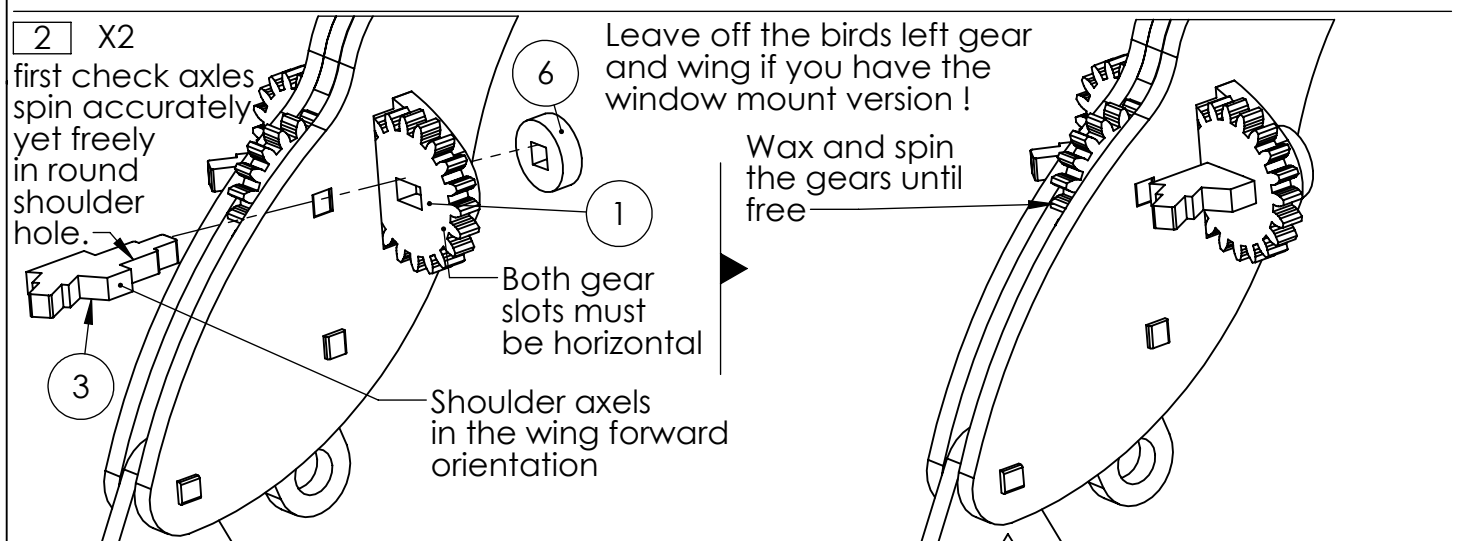
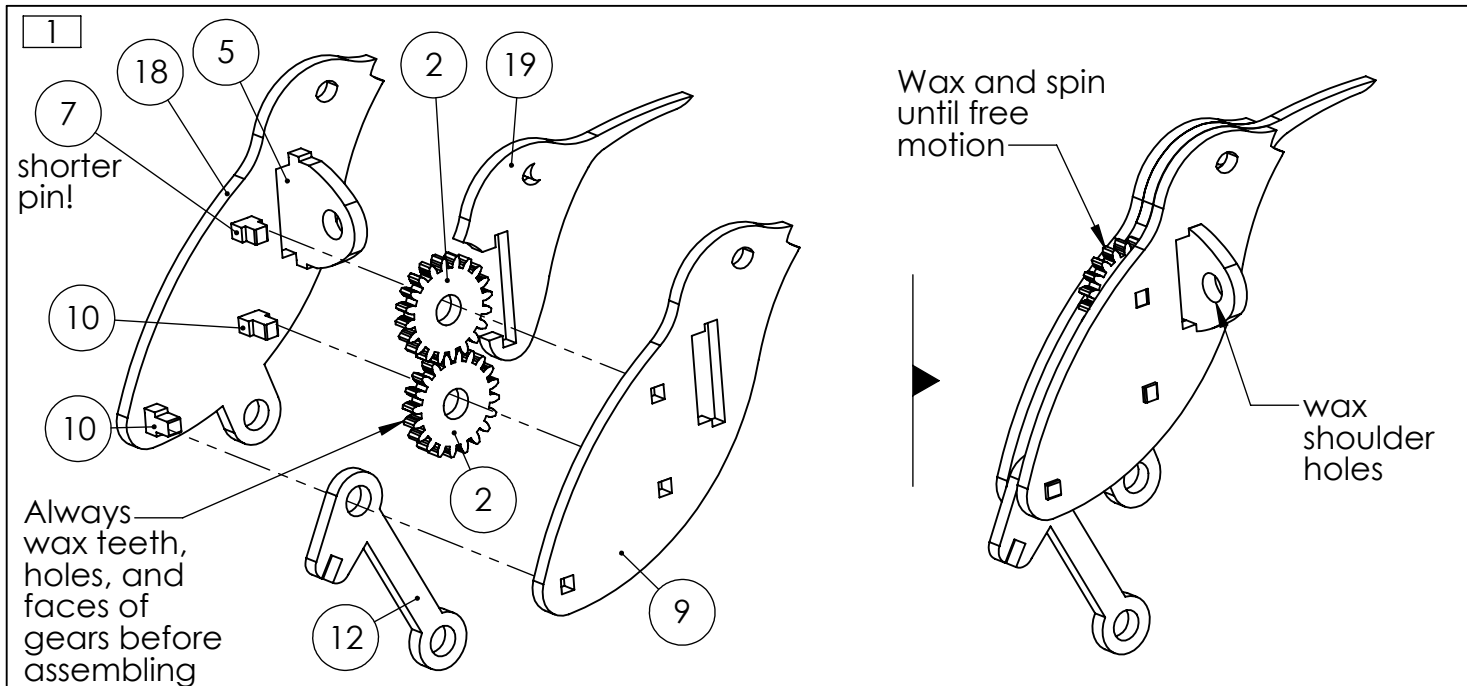
My SVG files must be imported at 72 DPI for correct sizing.

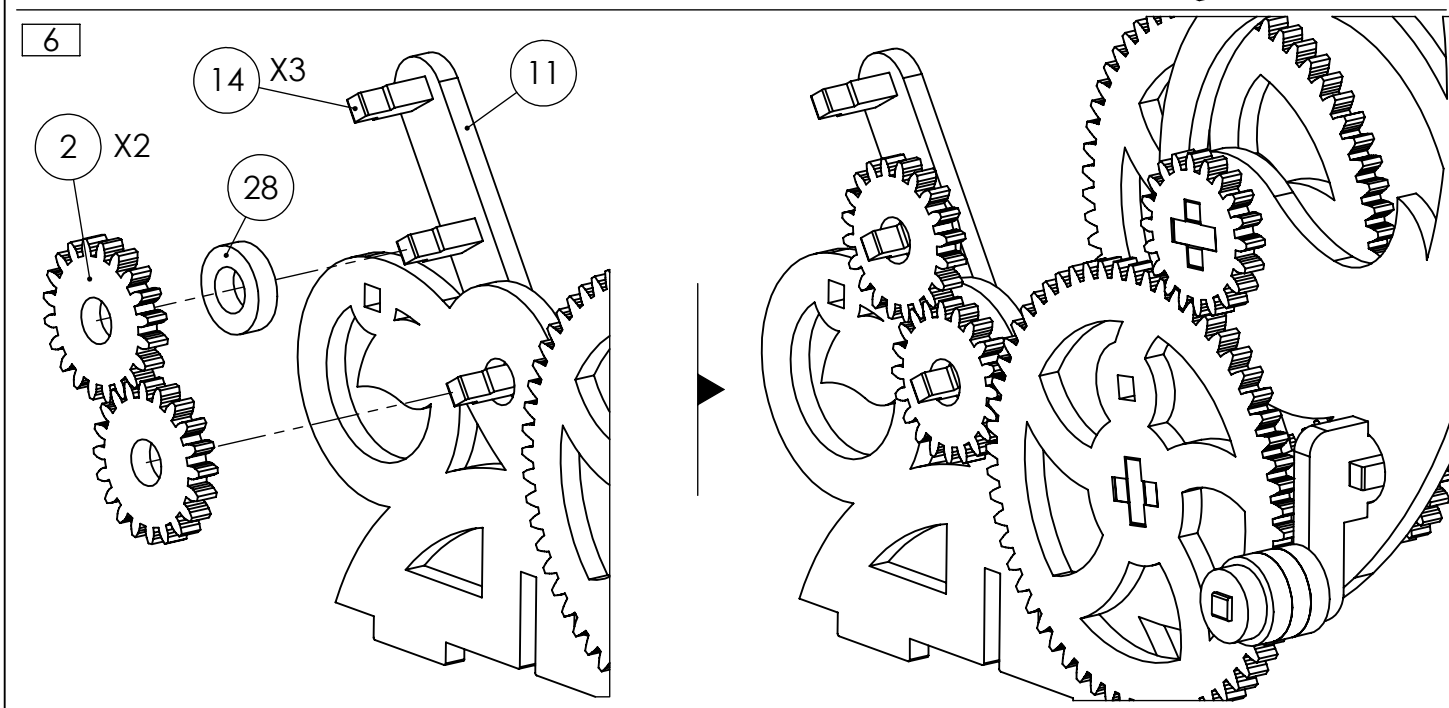
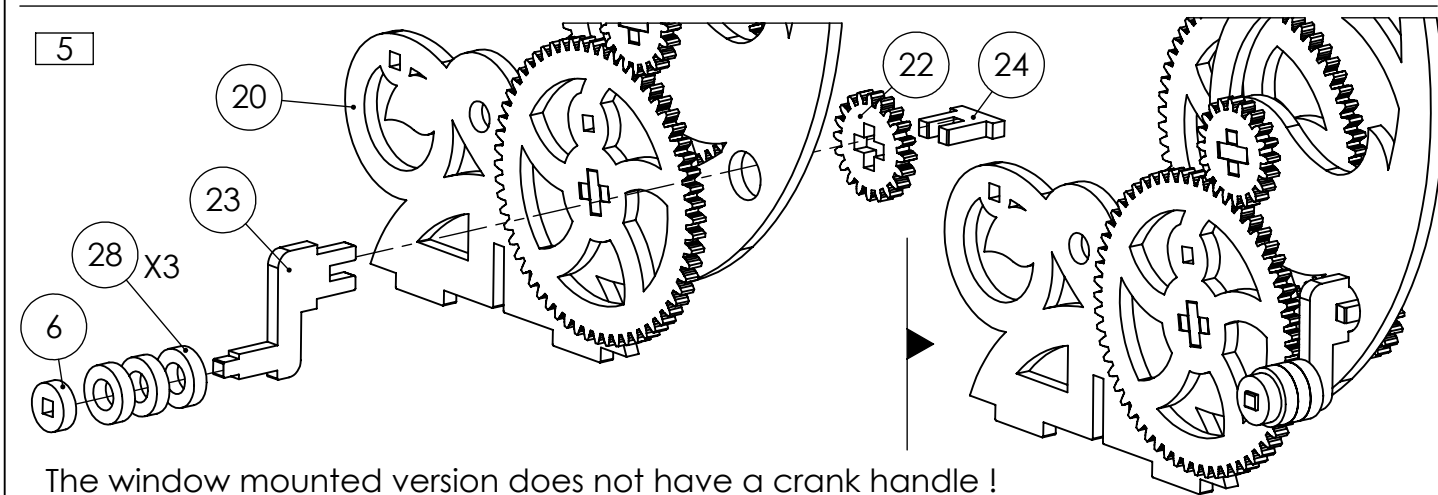
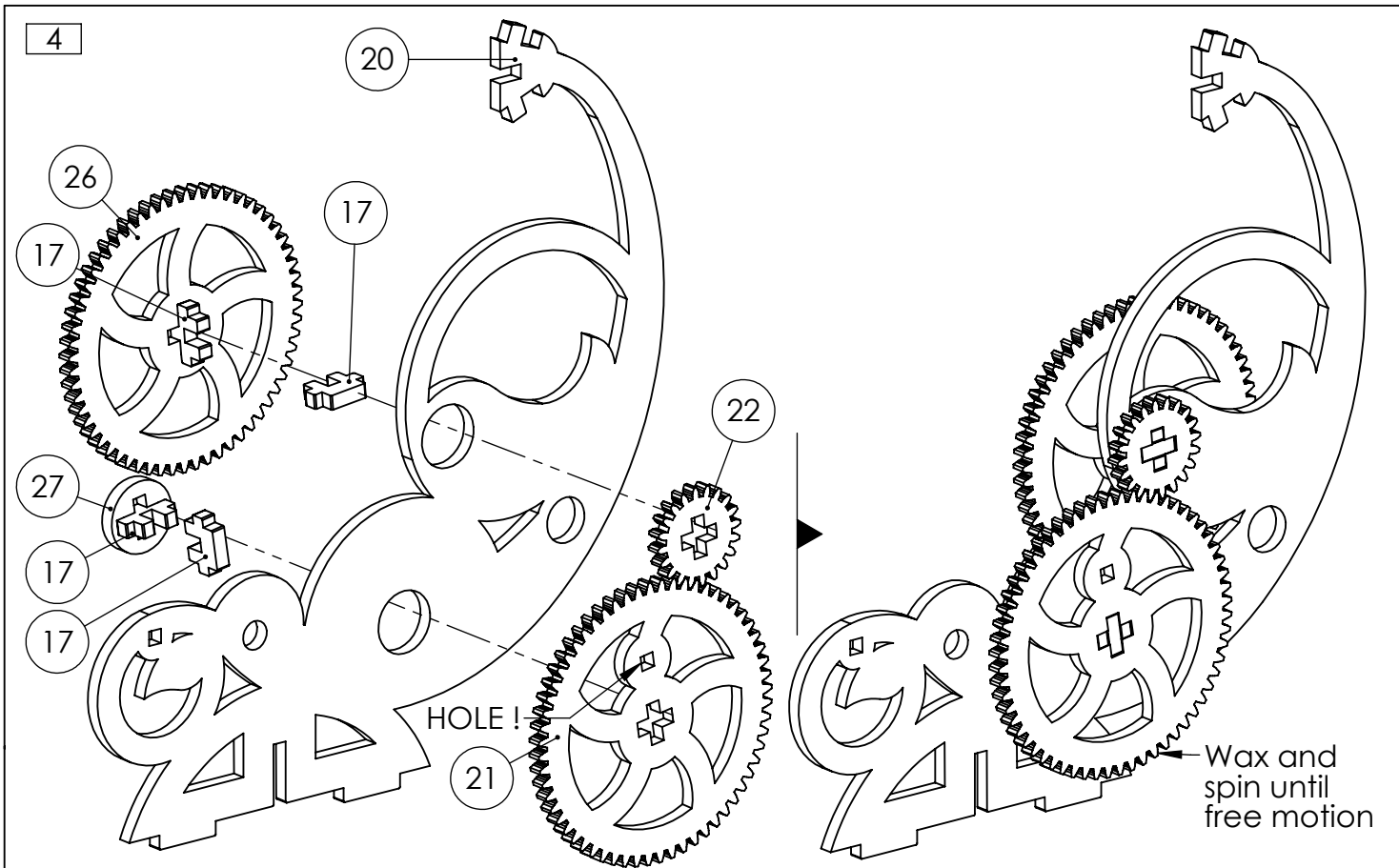
To read any updated advice for laser cutting my files or to contact me for help, visit www.ContraptionCart.com/lasercuttingtips

Important - assembly Instructions

- Cut the 2 holding tabs to press out parts as needed.
- Sand off any rough edges
- Wax all round holes and gear teeth before assembly.
- Press parts together very carefully in a well supported manner.
- Press parts down on a table if needed.
- When pushing parts in that protrude, put a spare part with a hole in it between that part and the table as you press the part in.
- Glue any loose parts with PVA wood glue or super glue, while being careful not to stick any moving parts.
- Ensure gear teeth are clean and unblocked before assembling.
- Work gears in at each step by spinning them gently. This helps to reduce the difficulty in locating any binding gears at the end.
- You will have either the table mount version or the window mount version.
- The large plant piece is missing the base and some holes in the window mount version

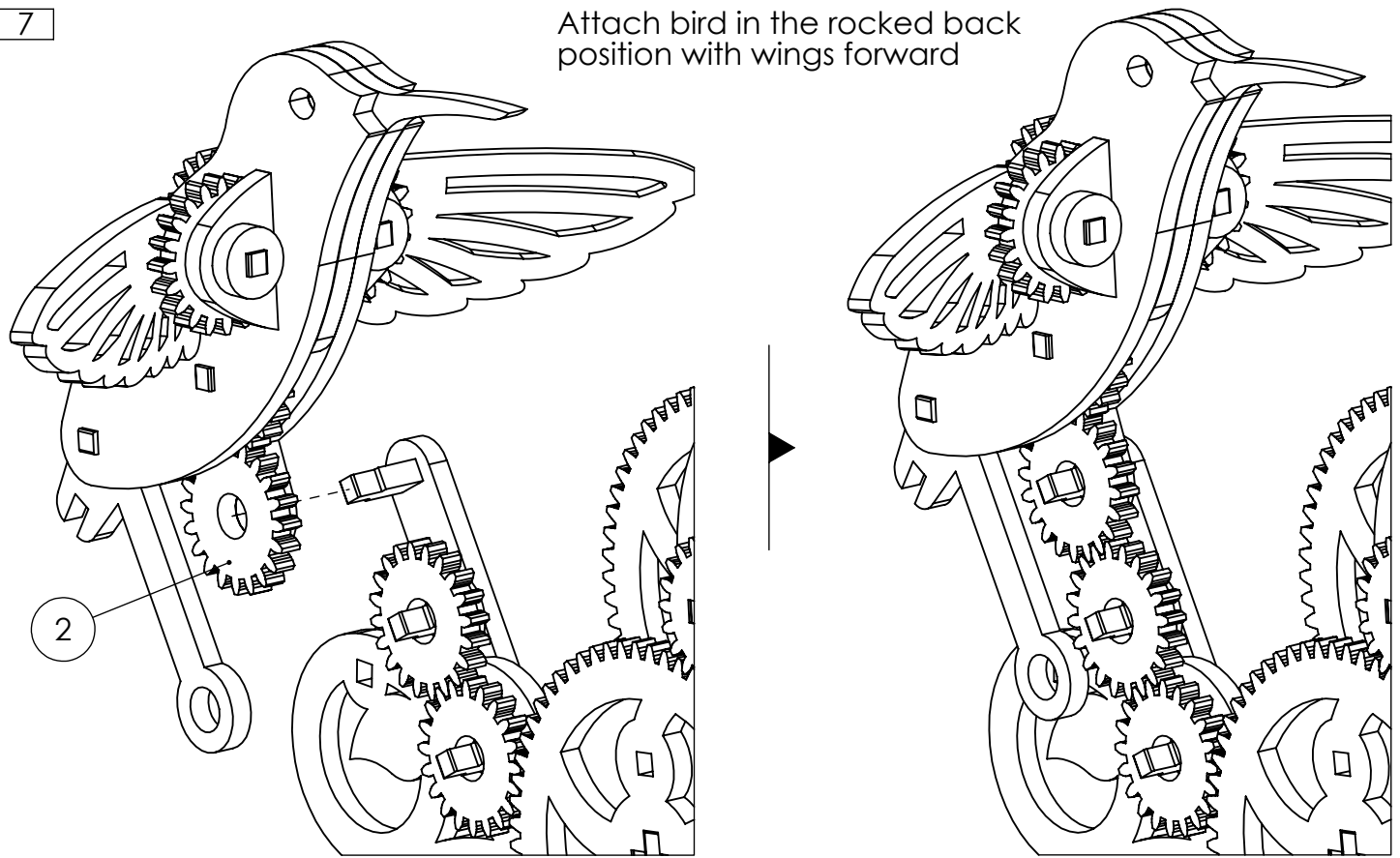




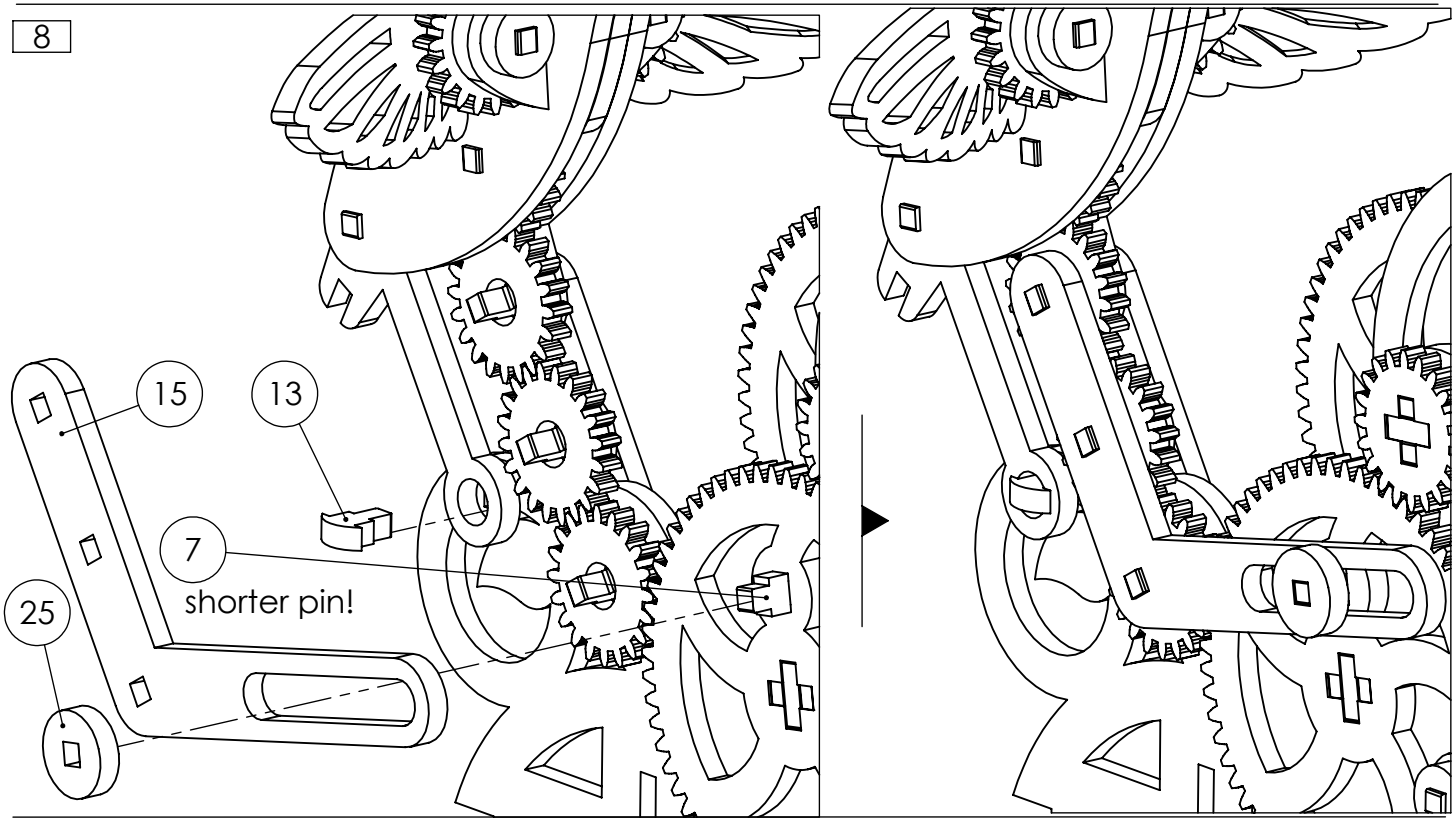


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Attach bird in the rocked back position with wings forward

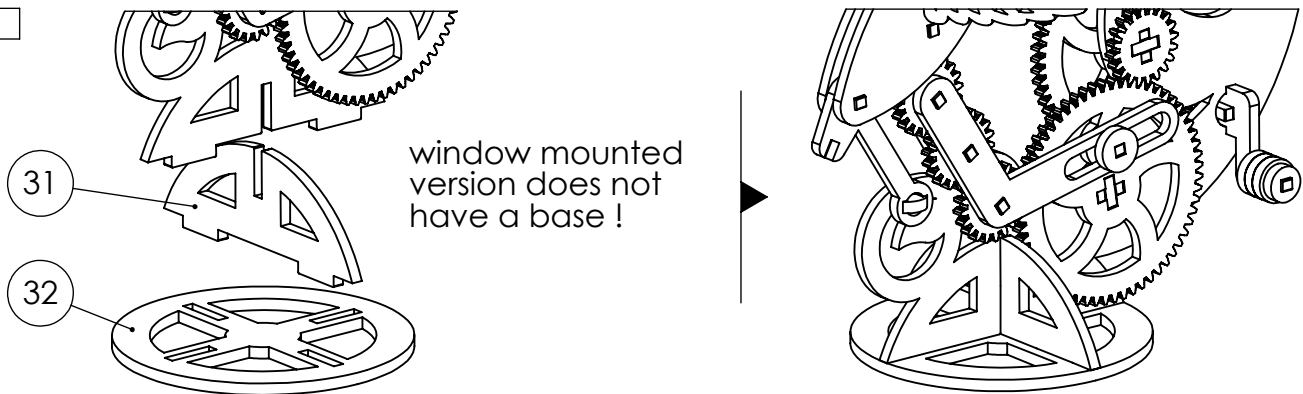


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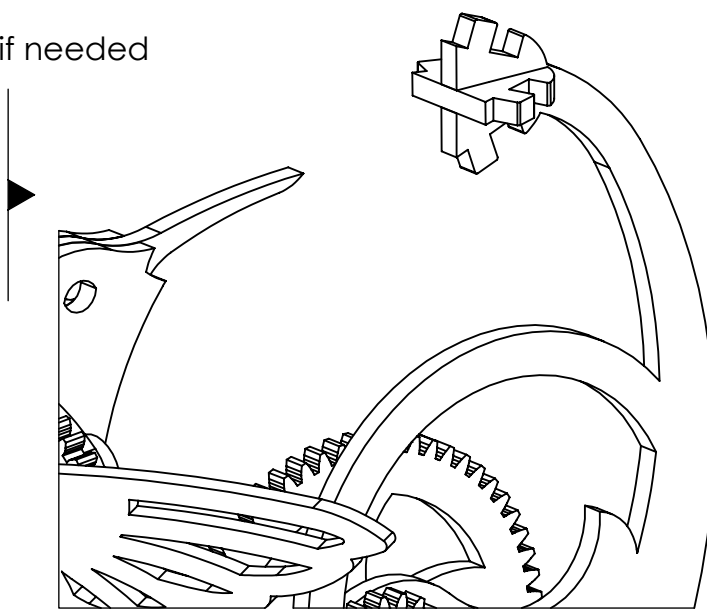
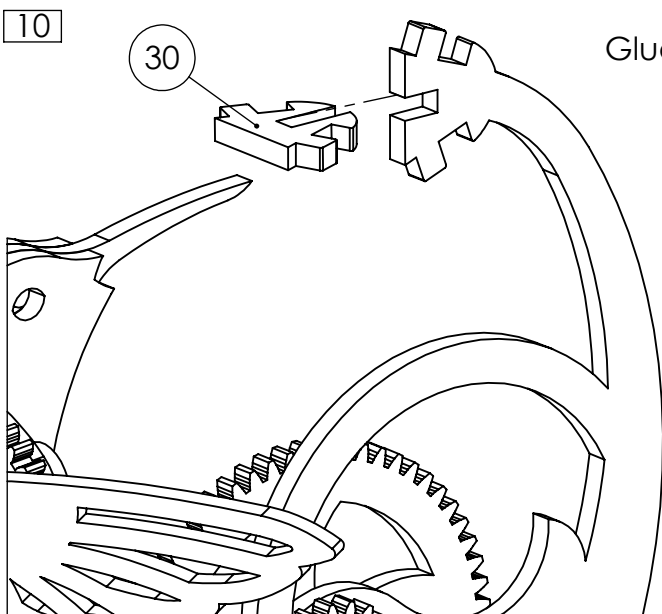
window mounted version does not have a base !



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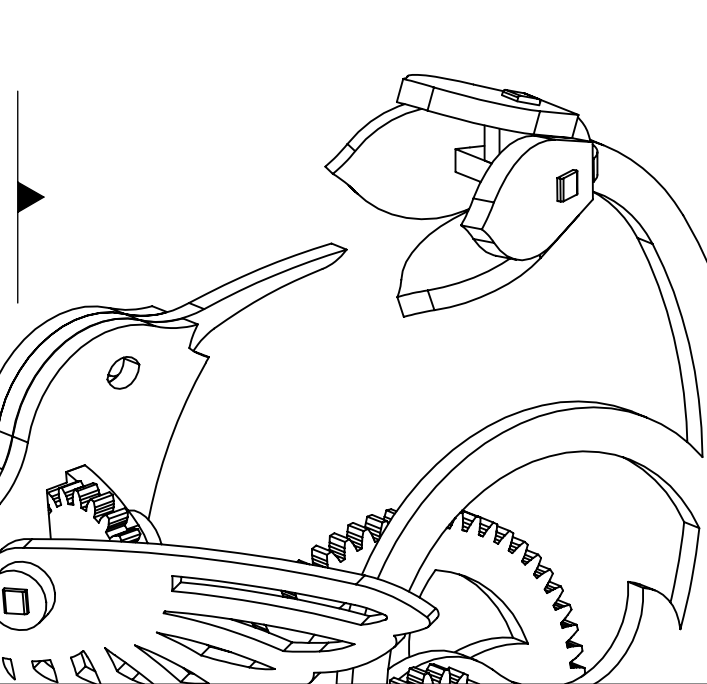
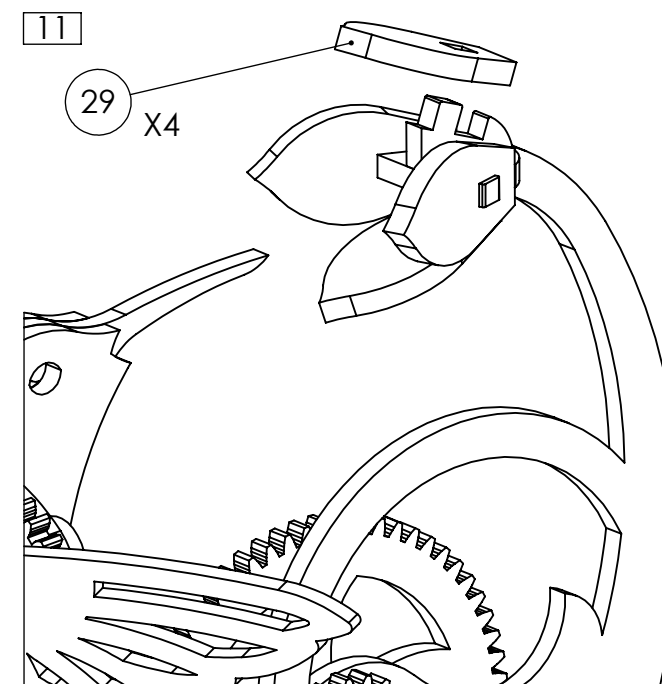
Glue if needed



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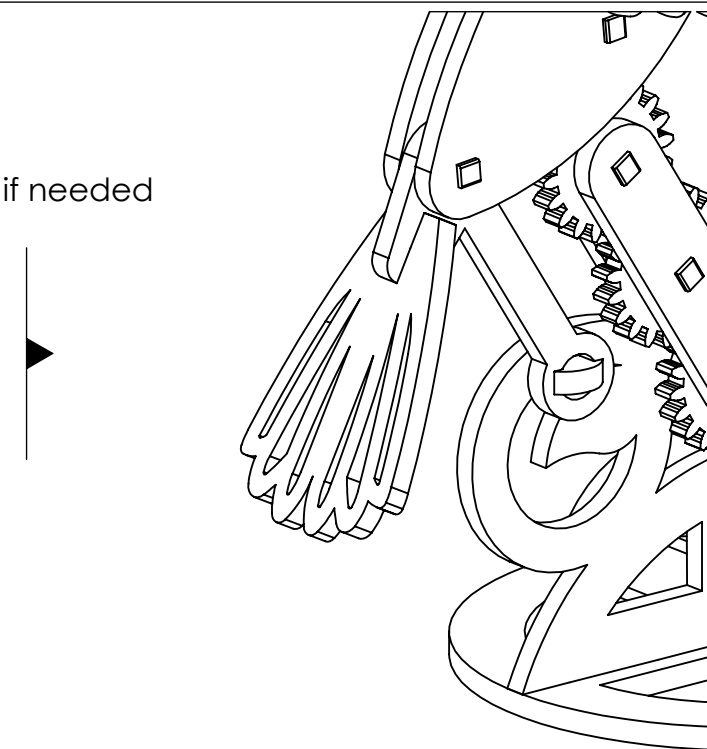
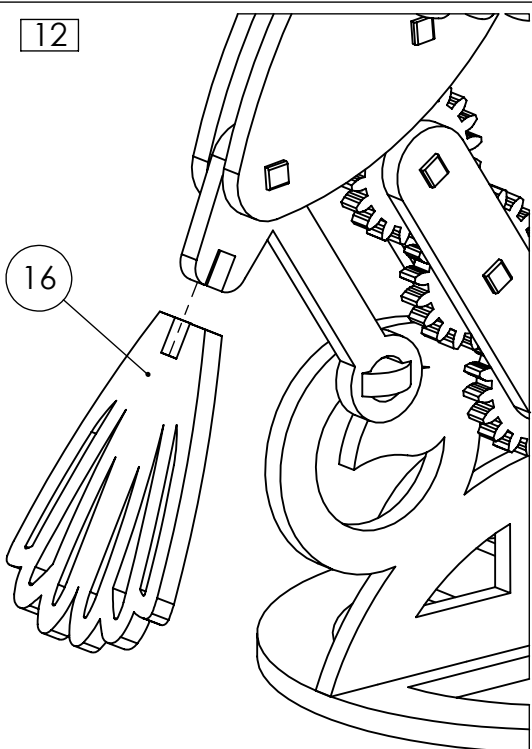
X4

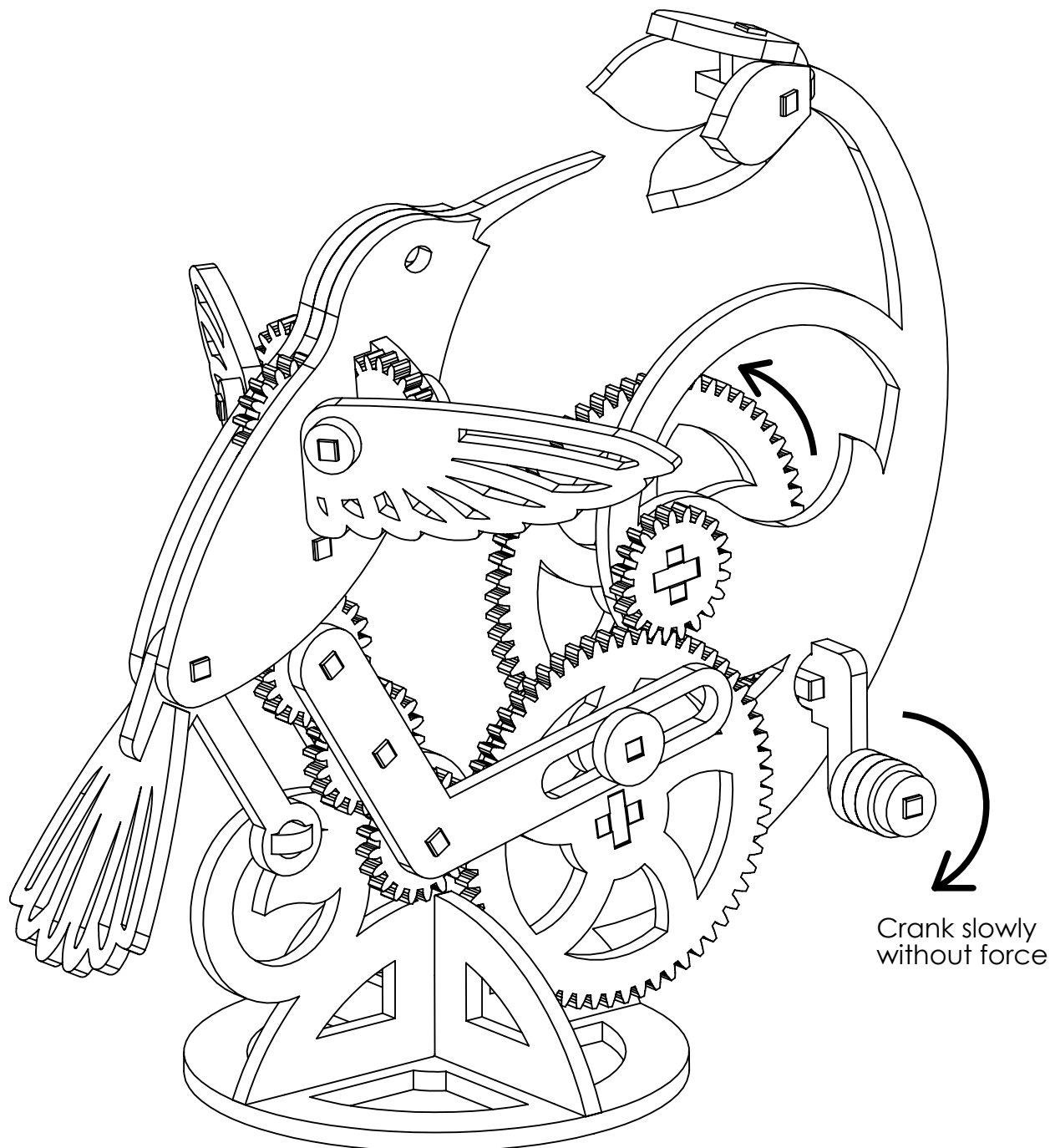


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Glue if needed





You will now need to work the gears in before it all runs smoothly.
Turn the handle or large gear slowly without force.
As soon as things start to jam, stop and wiggle the gear back and forth in tiny increments while assisting individual gears directly.
The mechanism should soon work itself in and start to run smoothly.
Add more wax to the gear teeth if needed.

The wings should flap while
the bird dips its beak
into the flower.