Marble Run Coaster

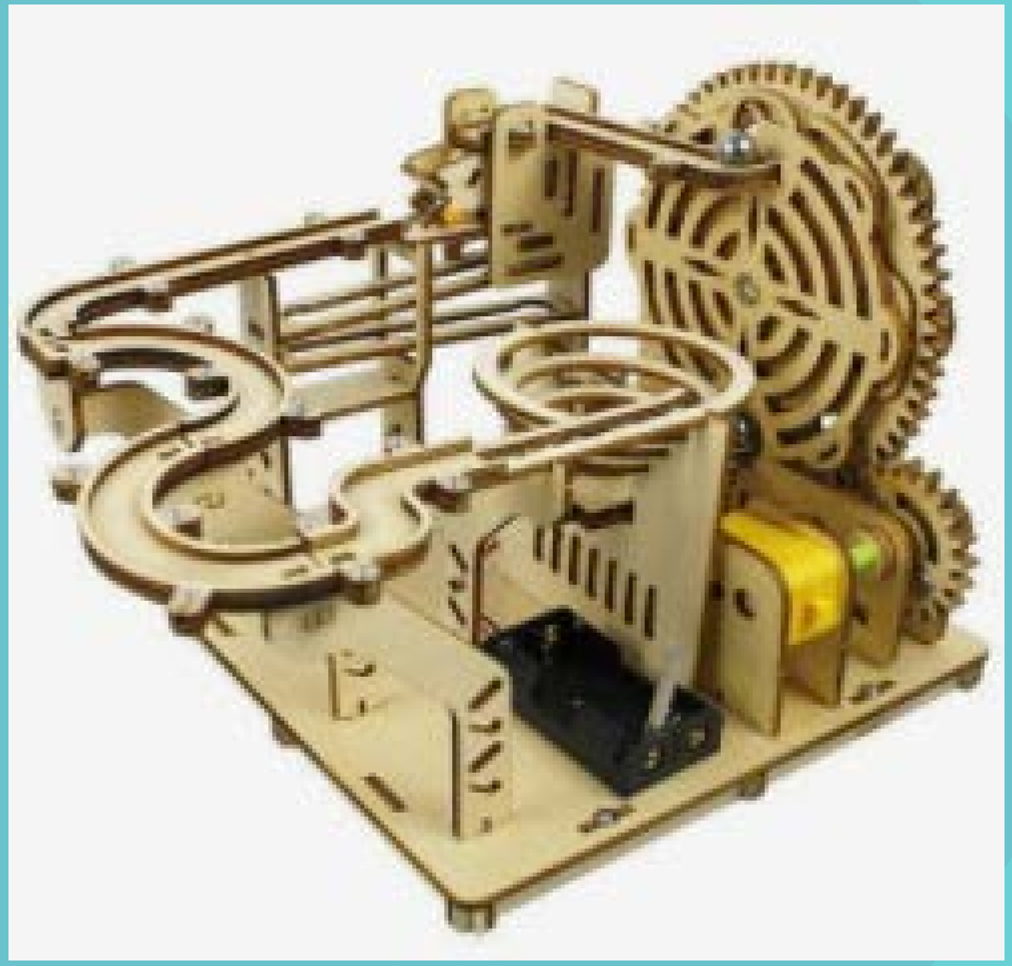
Experiment Objectives

1. To gain an initial understanding of the marble run.
2. To learn some basic knowledge about marble runs.
3. To stimulate children's interest in science experiments and cultivate their scientific thinking.

Introduction

Question Time

Do you recognize what the pictures below are?



They are marble runs.

Now, think about this — what kind of energy makes the marbles move along the track?

The marble run converts electrical energy into mechanical energy, which drives the gears to rotate.

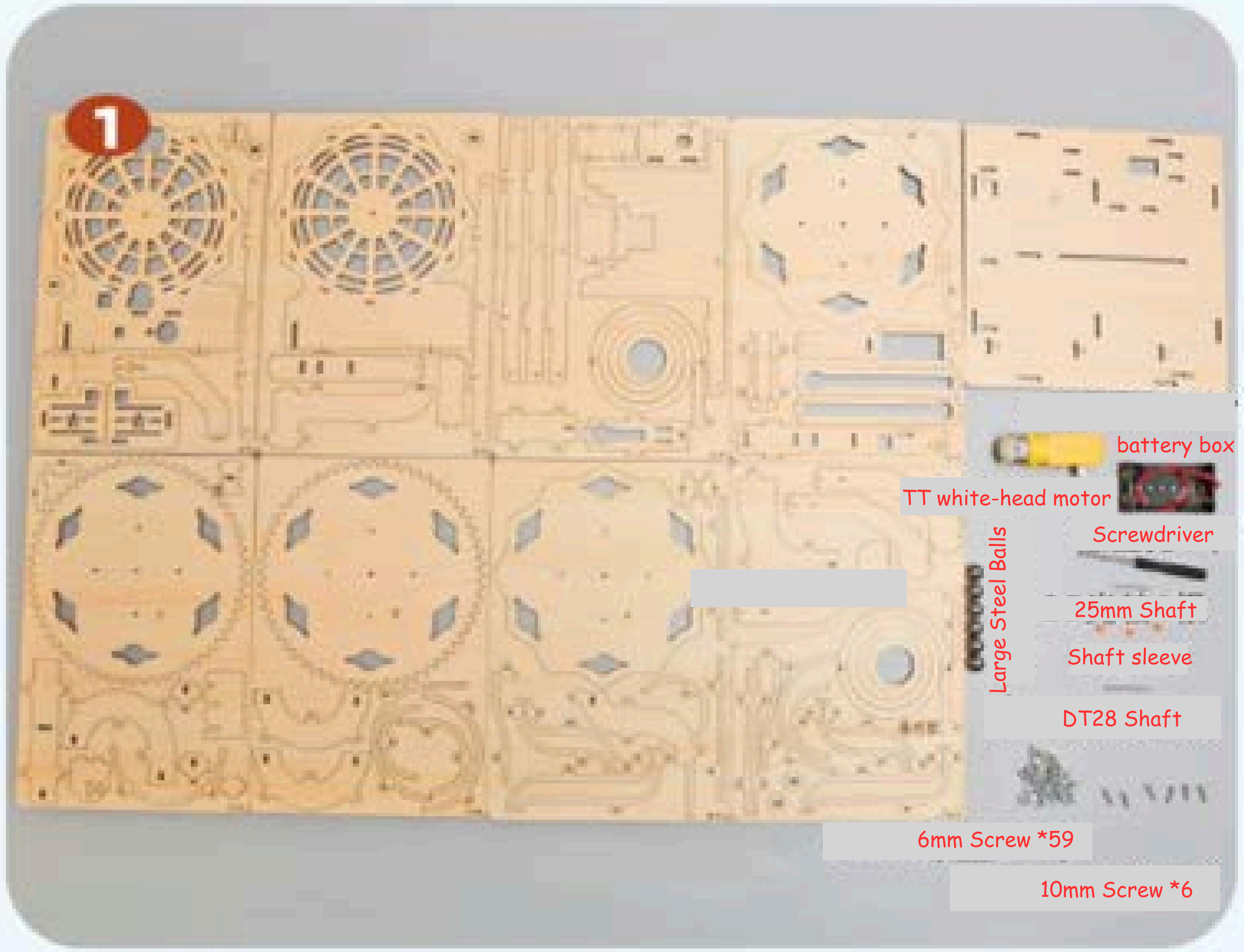
As the gears keep turning, the marbles roll out and move along the track.

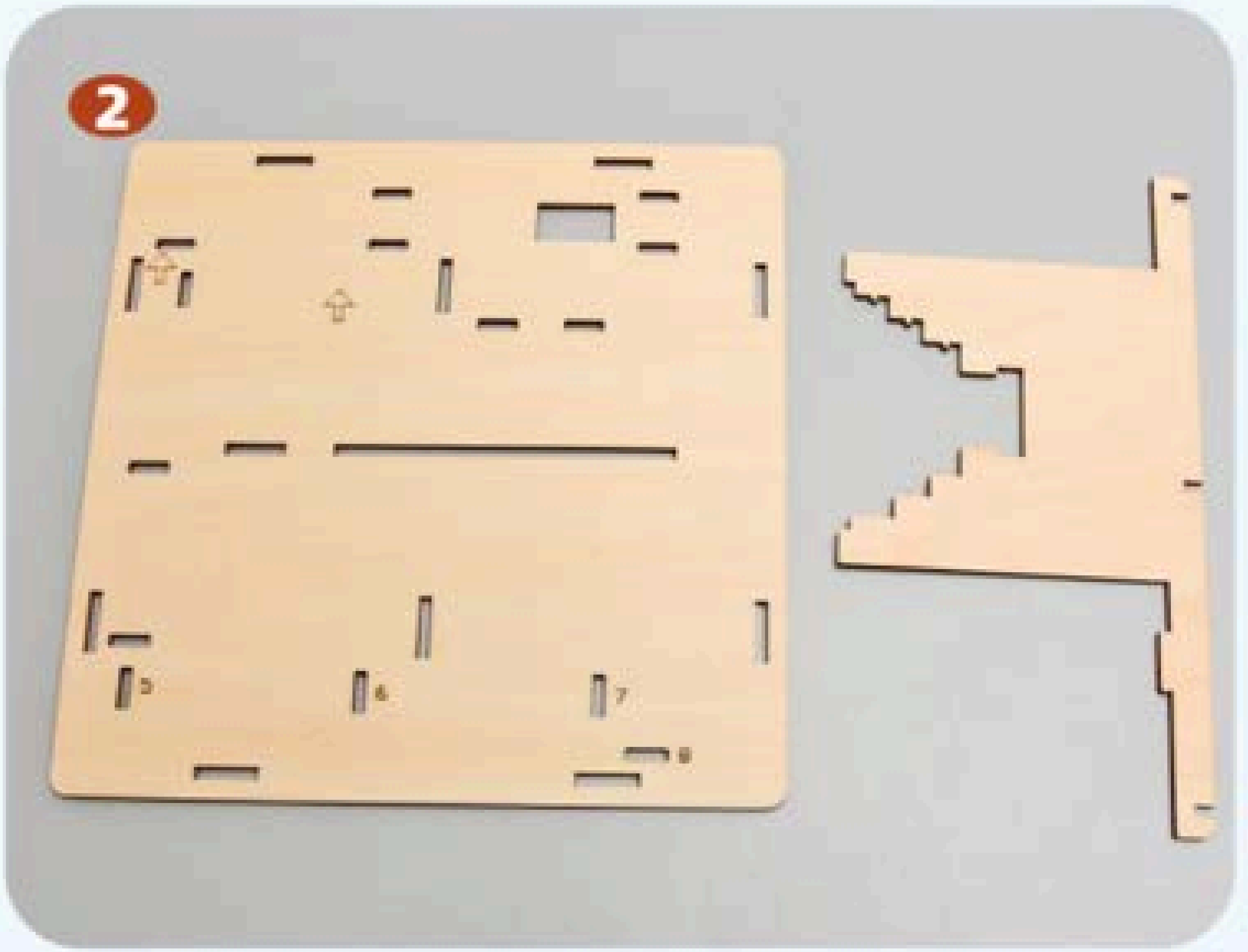
Finally, the marbles fall back into the gear system, creating a continuous loop of motion.

Let's build our own marble run coaster together!

Experiment Steps

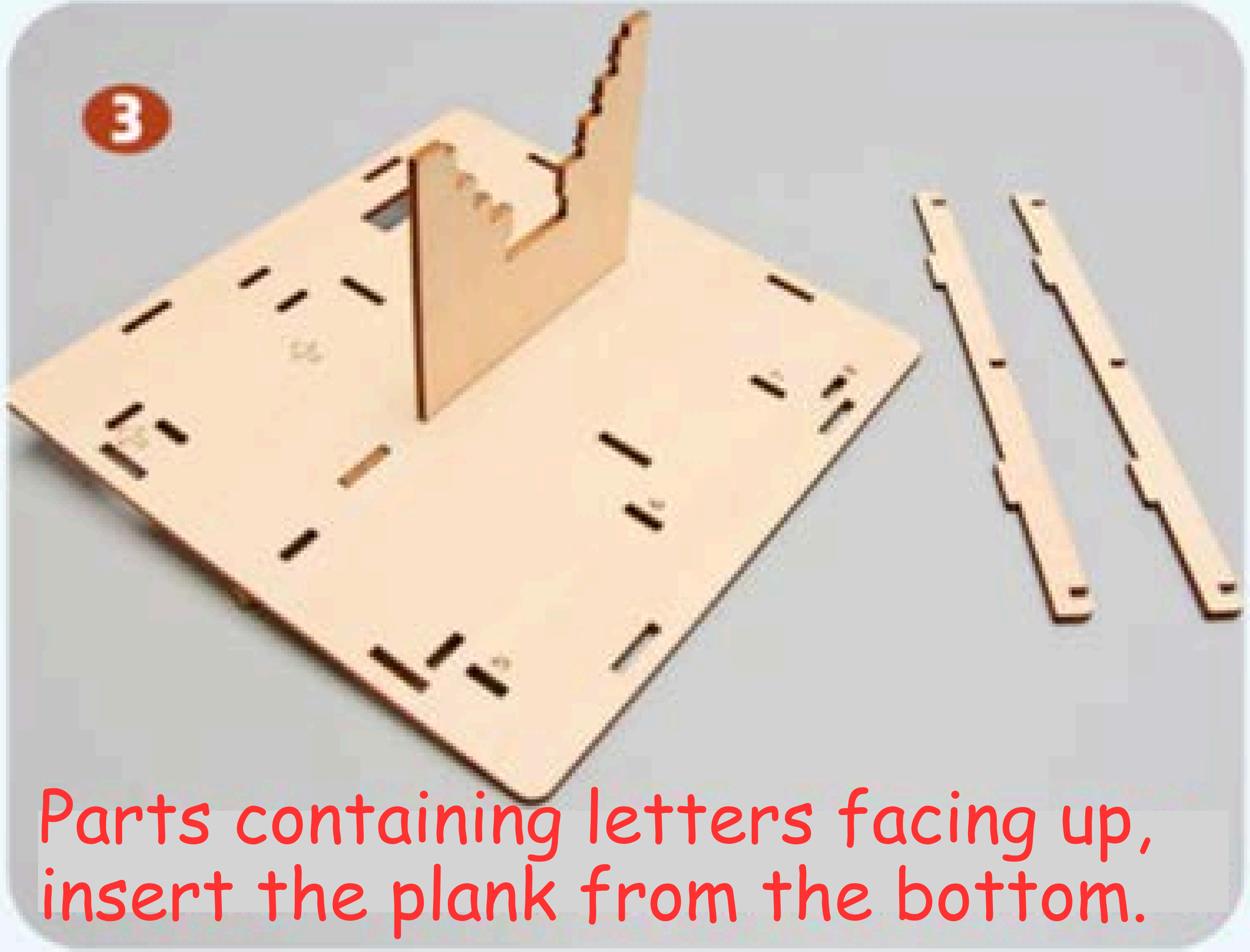
Let's get started!



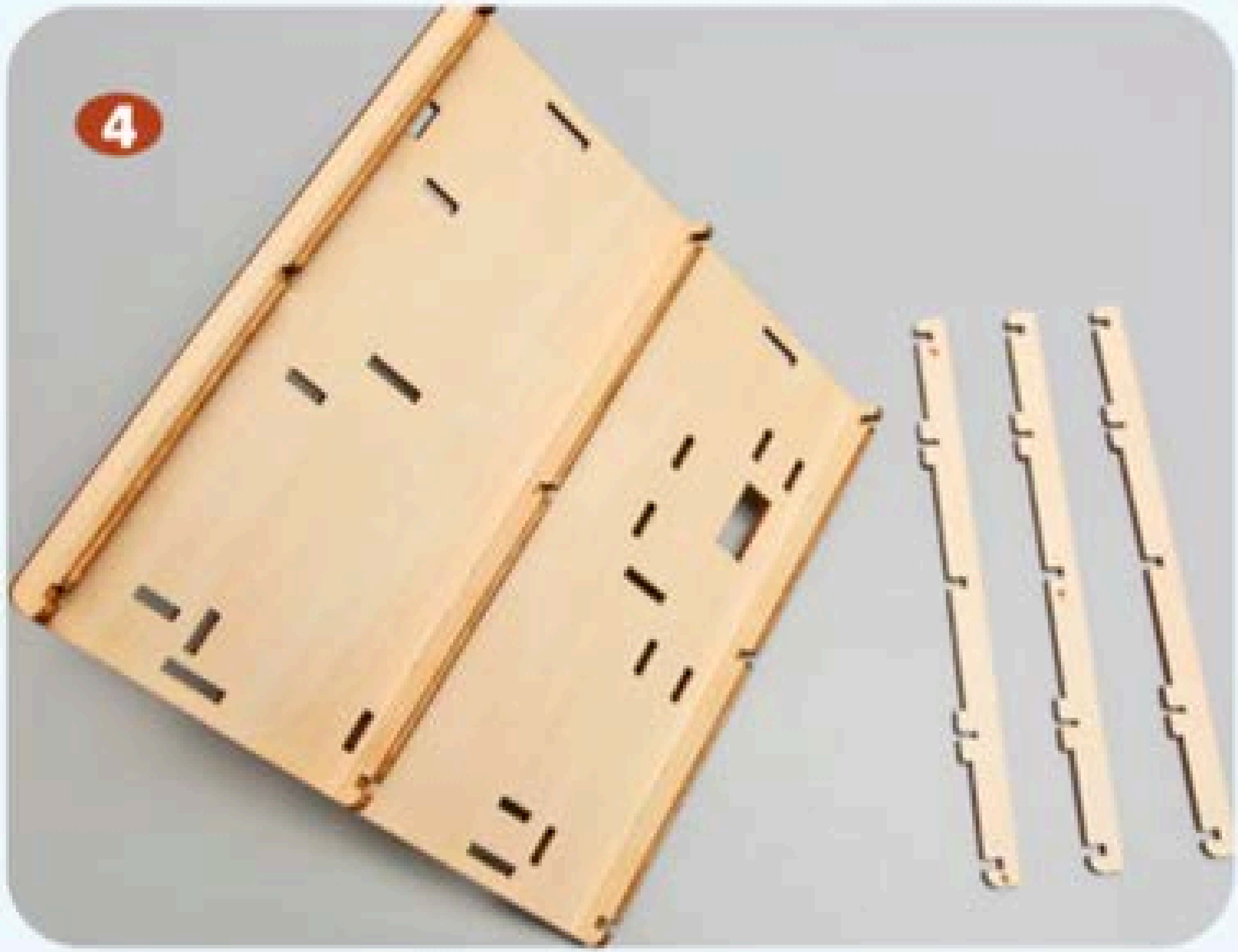


Recognize the Materials

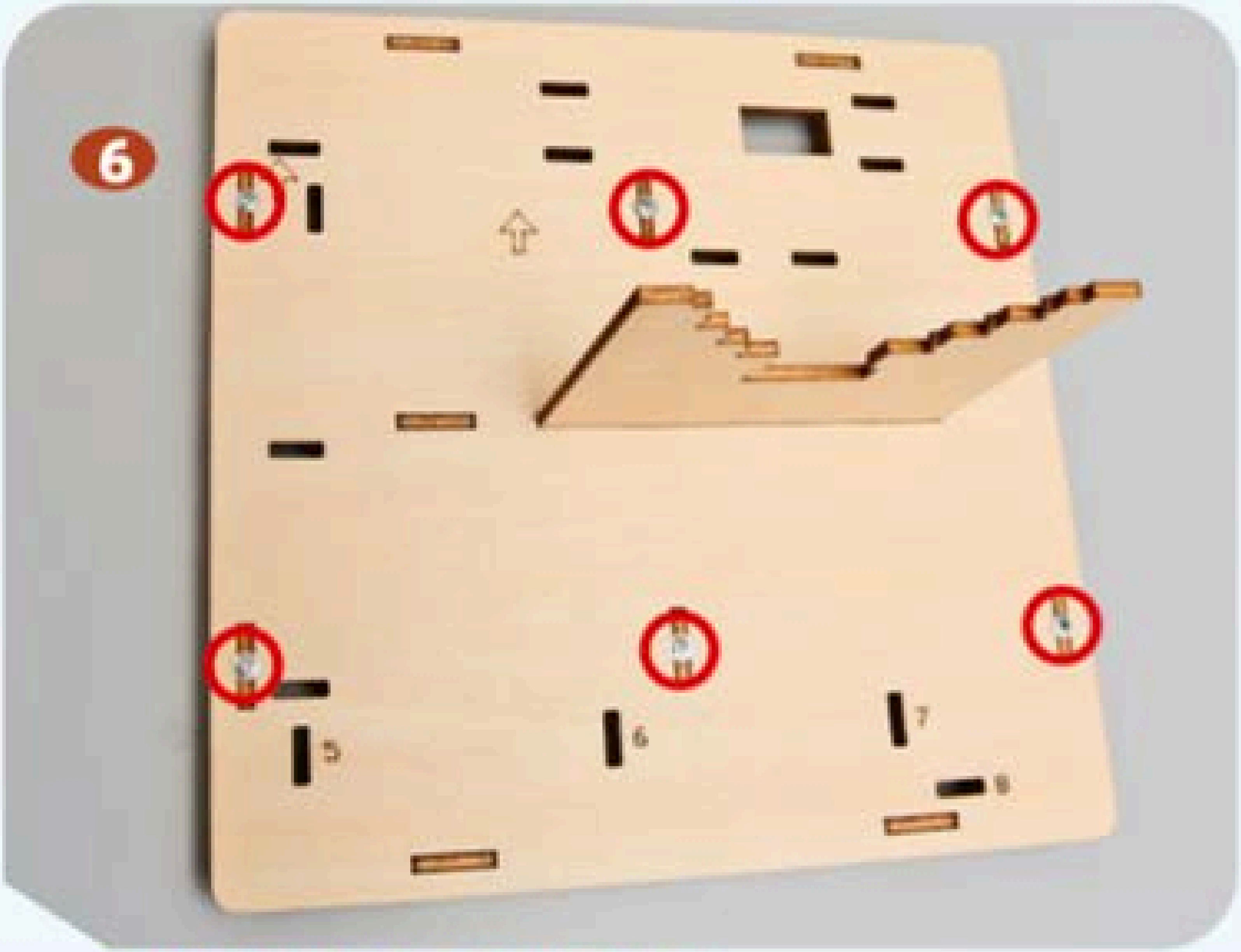
As shown in the picture, prepare all the wooden parts.



As shown in the picture, prepare wooden parts.

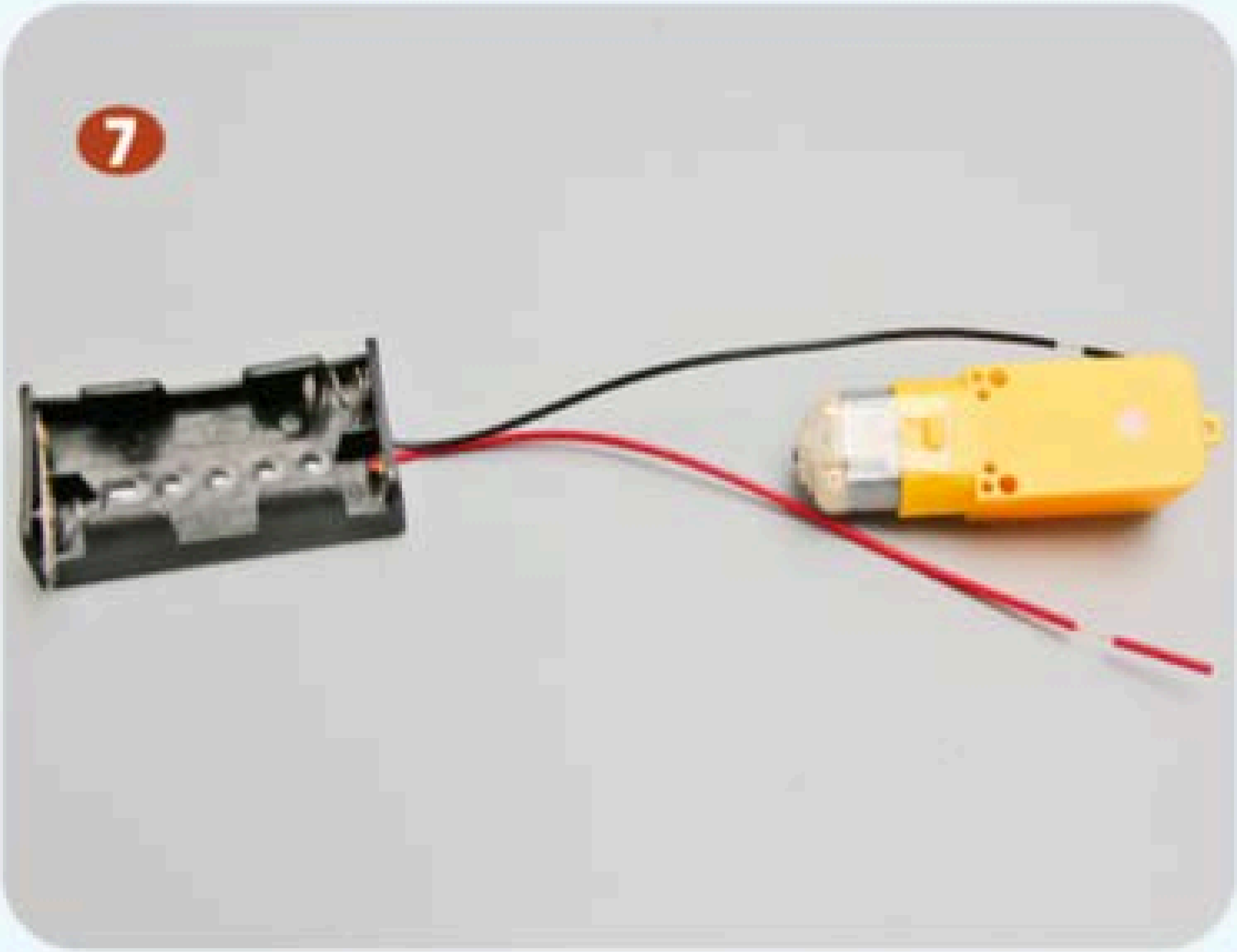


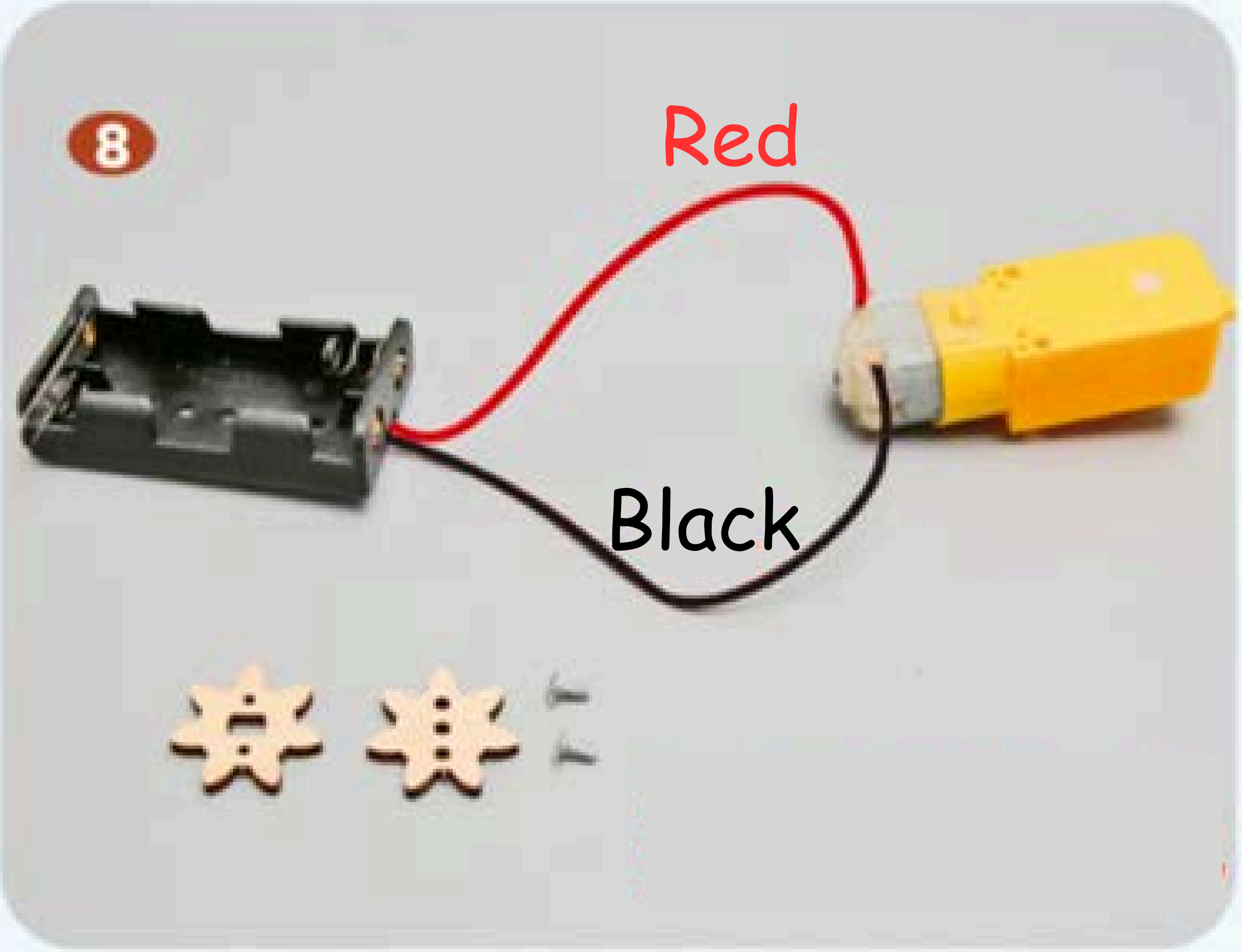
Assemble as shown, and prepare the next set of parts.



Assemble as shown, and prepare 6mm screw *6 .

Screw as shown.

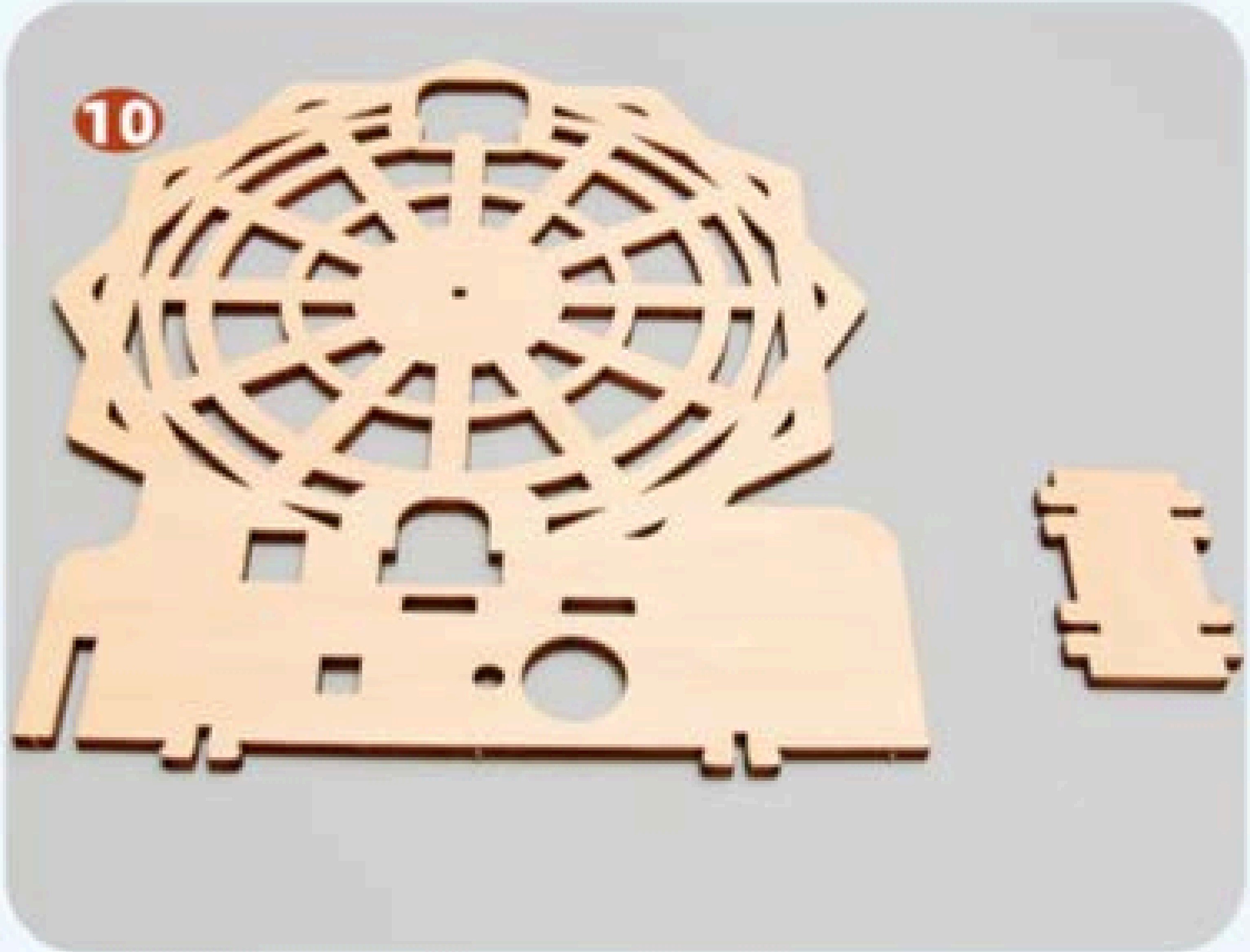




Prepare the TT motor and battery case.

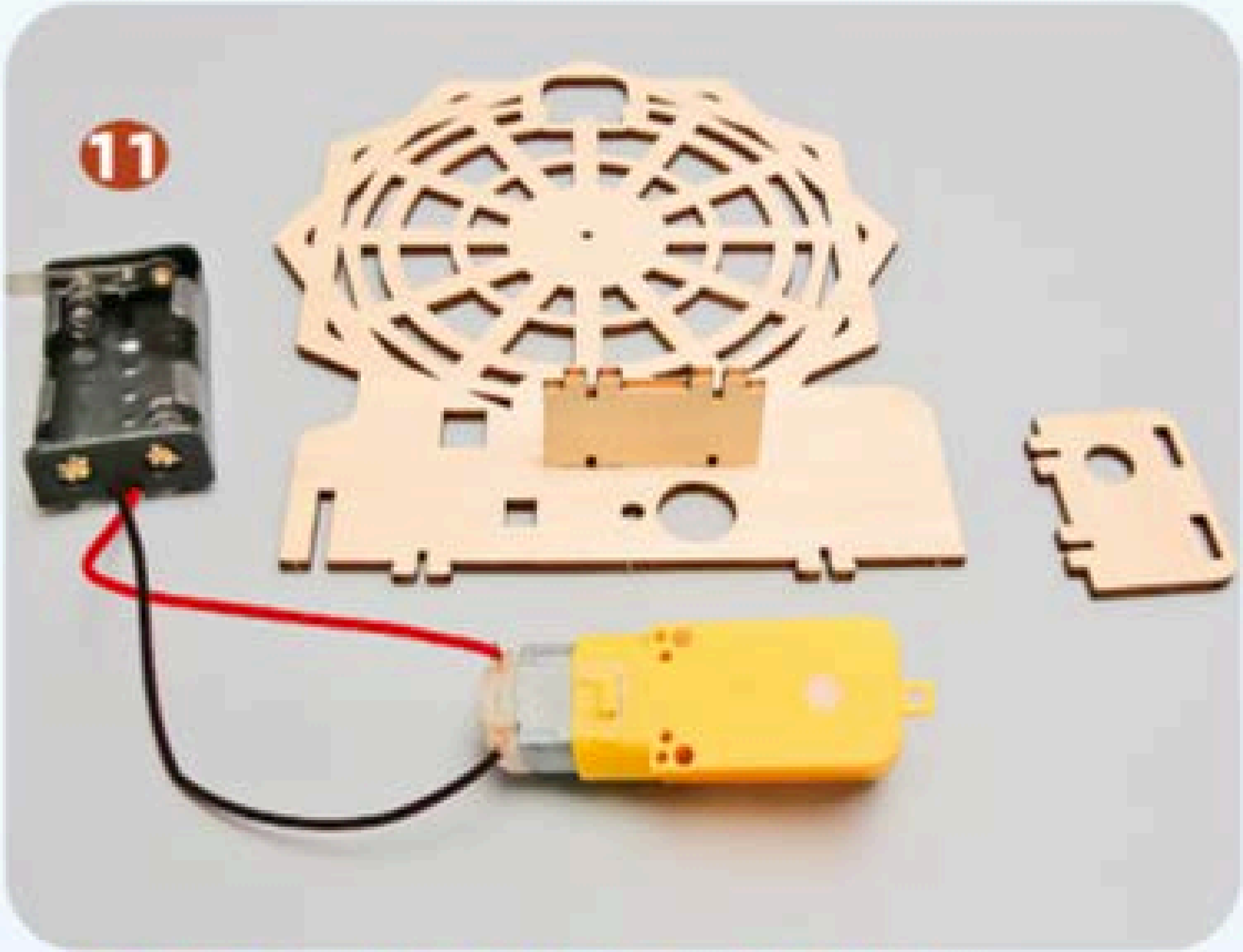
Connect the wires as shown..

Prepare the next parts and two 6mm screws.



Put two wooden star-shaped pieces together and insert screws as shown.

Prepare the next parts.



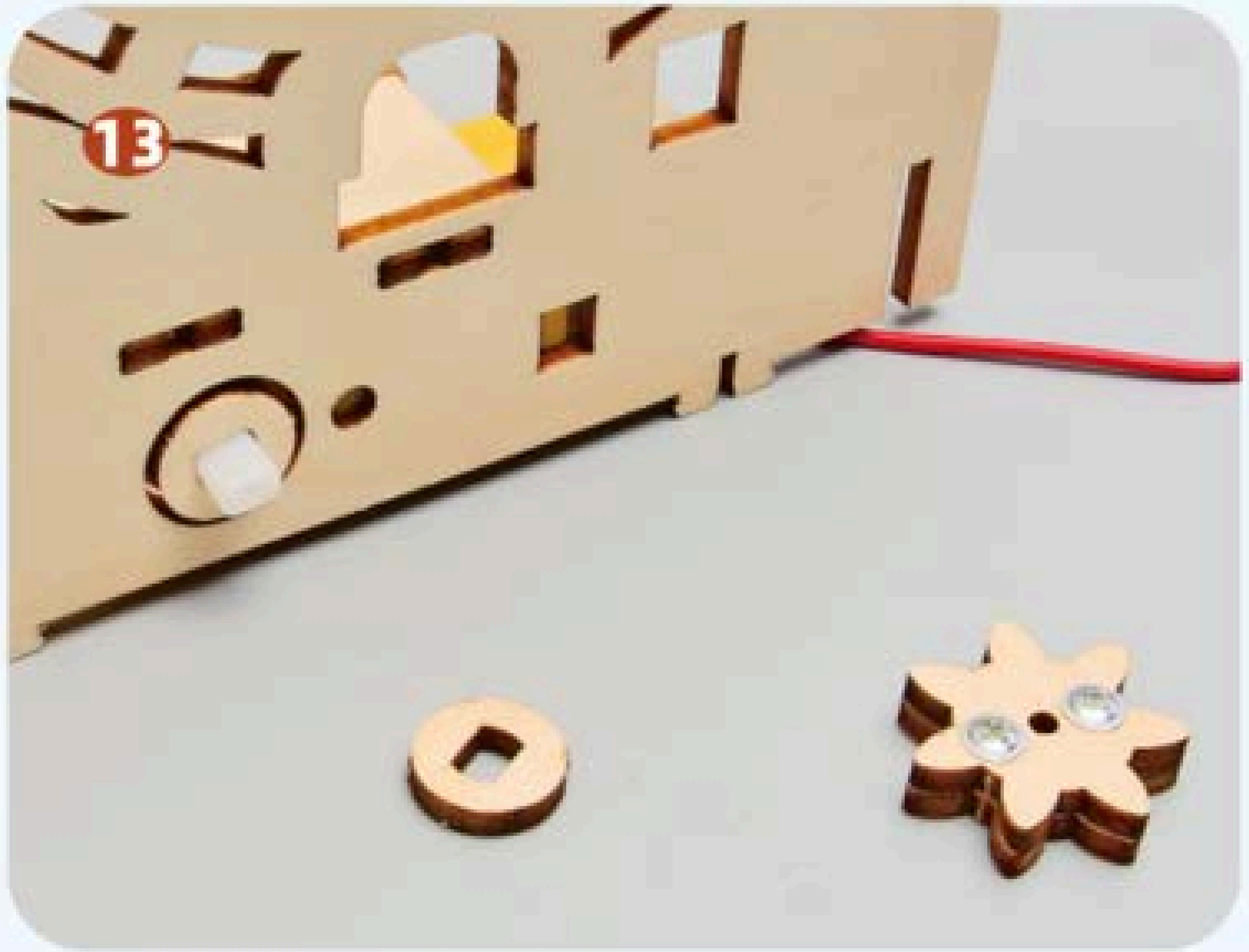
如图装好，准备好下一步零件

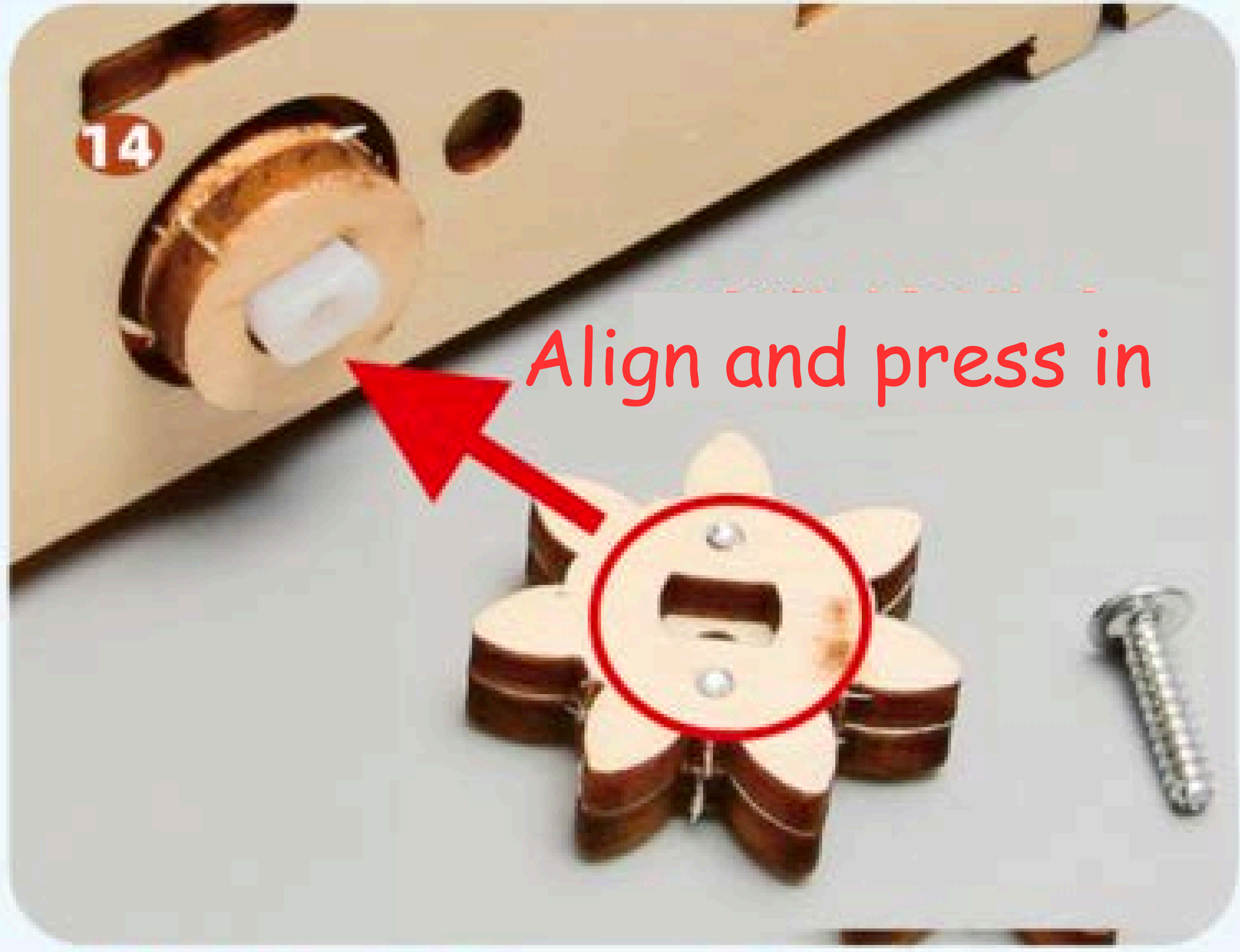
如图装好，准备好下一步零件

Assemble as shown

Assemble as shown

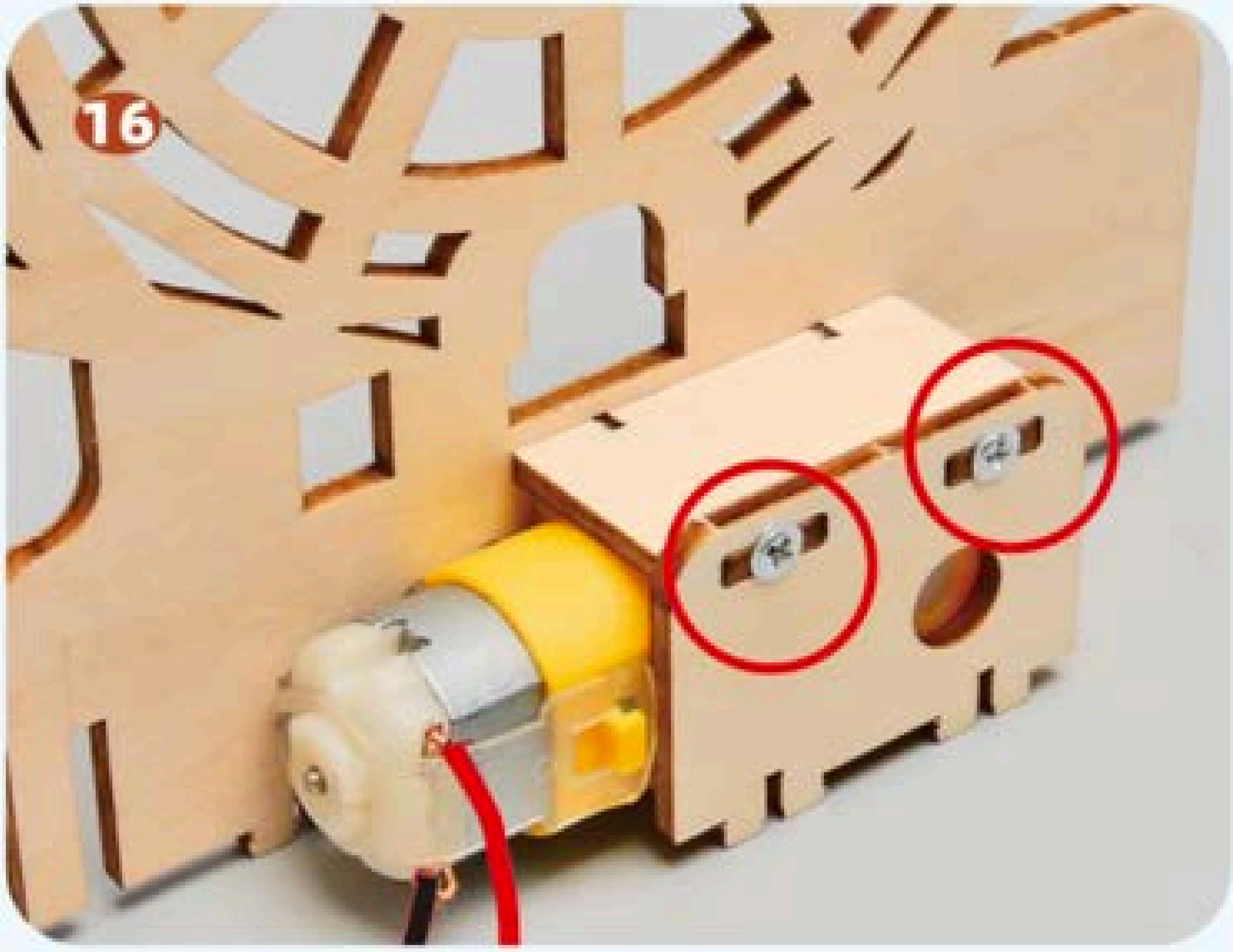
Prepare the next parts.





Assemble as shown.

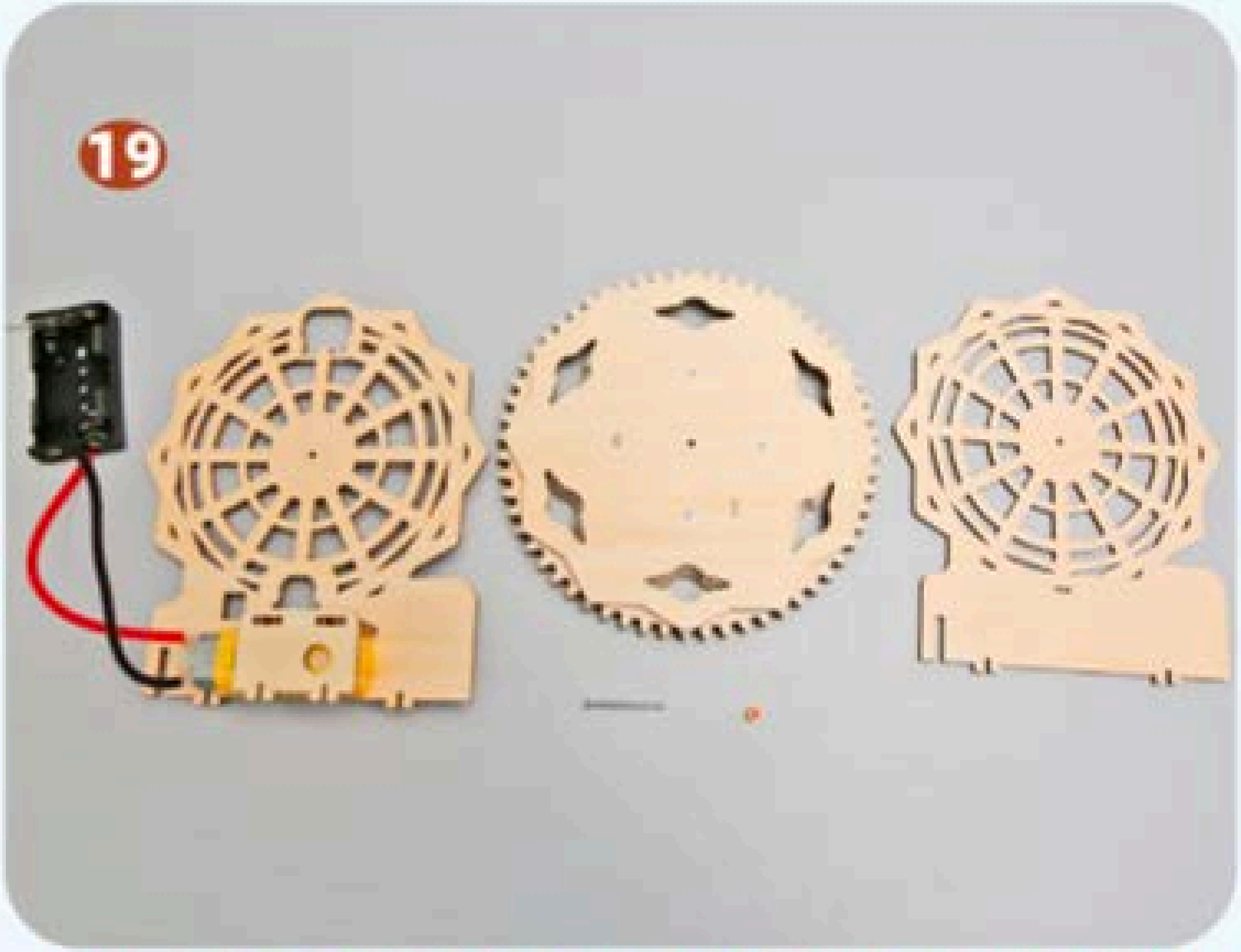
Assemble as shown, prepare a 10 mm screw.



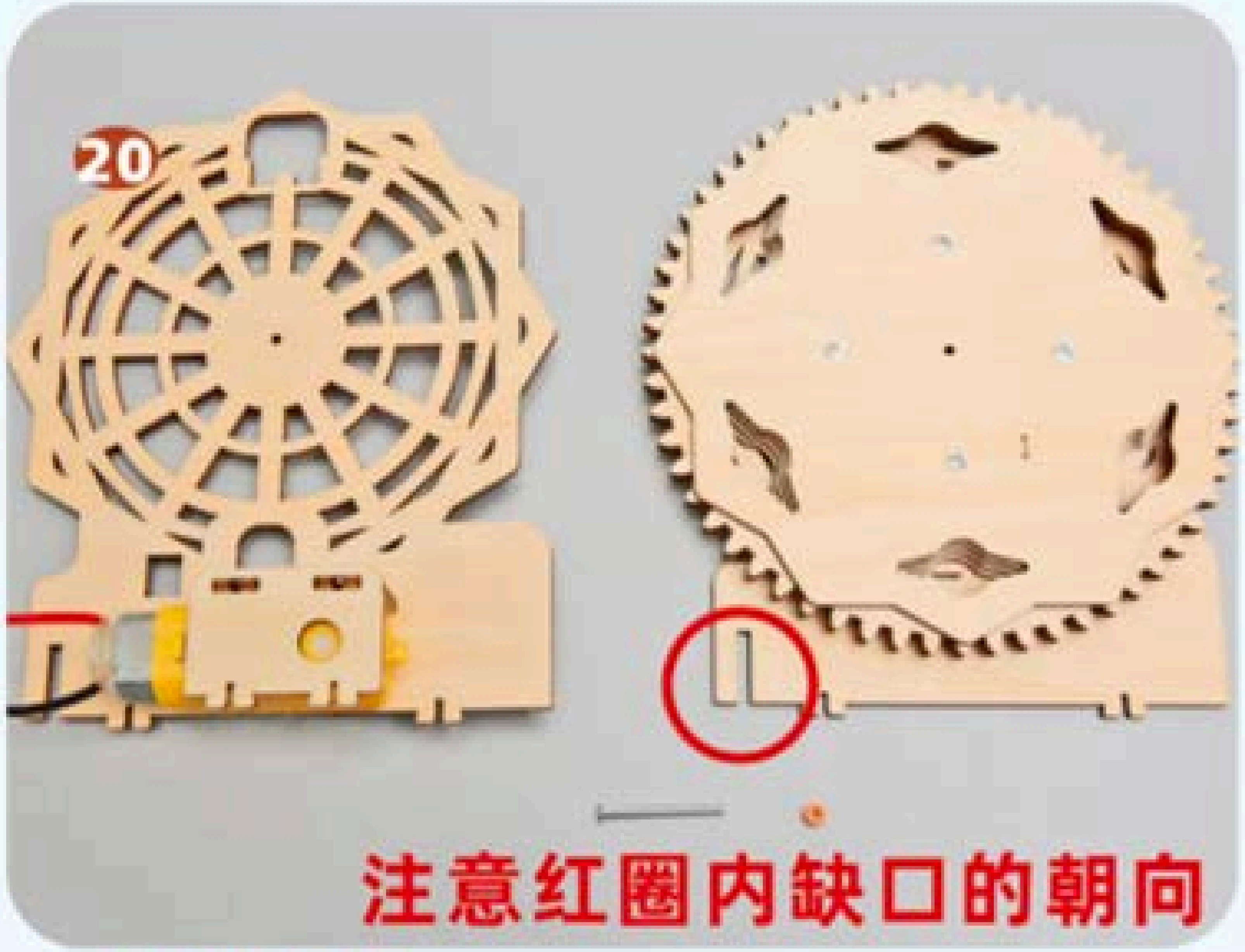
Use the red circles as a guide to insert 6mm screws,

Green circles for 10mm screws.

Stack the four round plates in order, with Plate 1 on top.
Align the holes and fasten with four 10 mm screws as shown.



Prepare as shown , DT 28 shaft & Shaft sleeves



Assemble as shown.

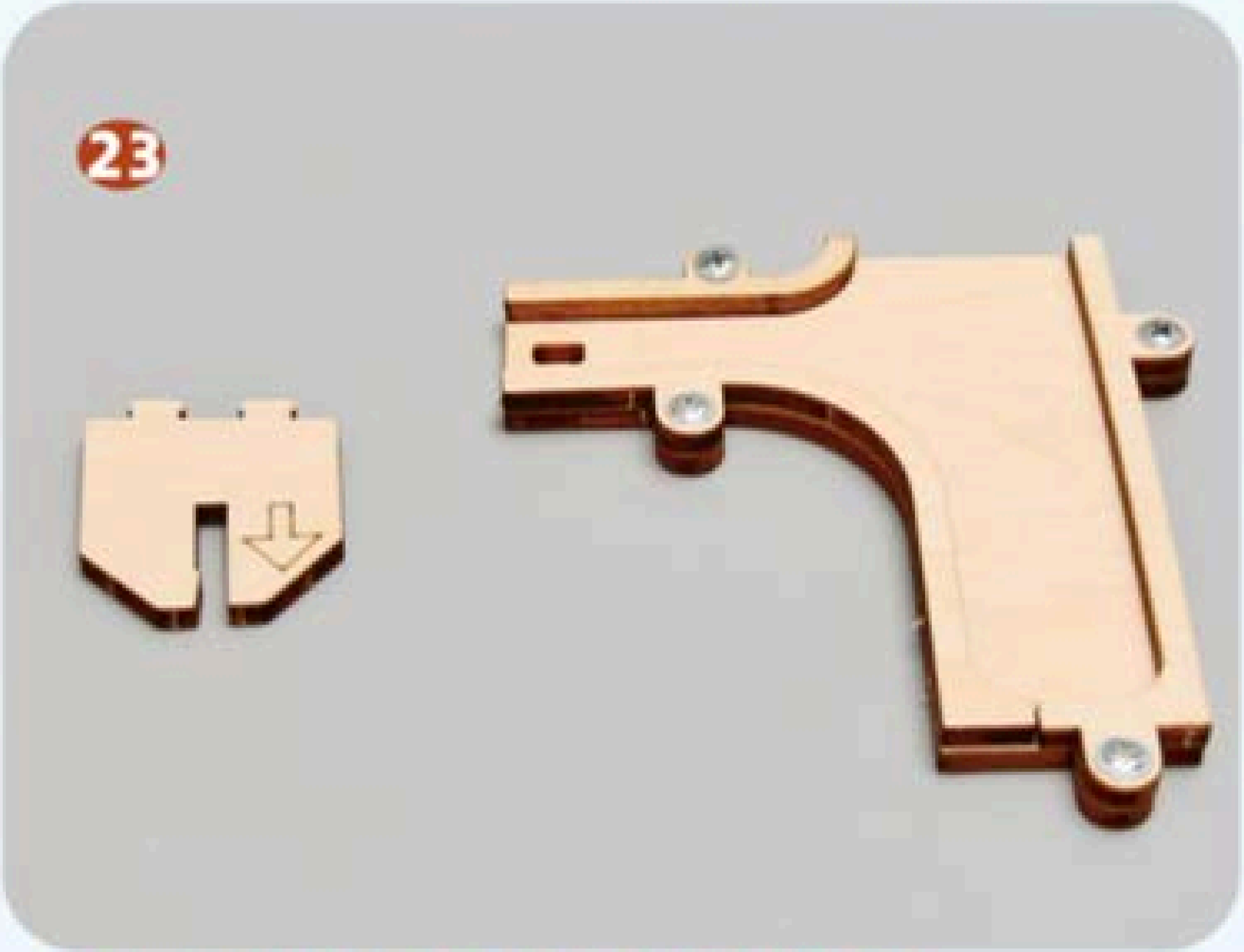
Take note on the red circle, yours should face the same side.

Assemble together and install the DT28 shaft.

Insert the DT28 shaft into the red-circled area.

Insert the shaft sleeve into the red-circled area on the back.

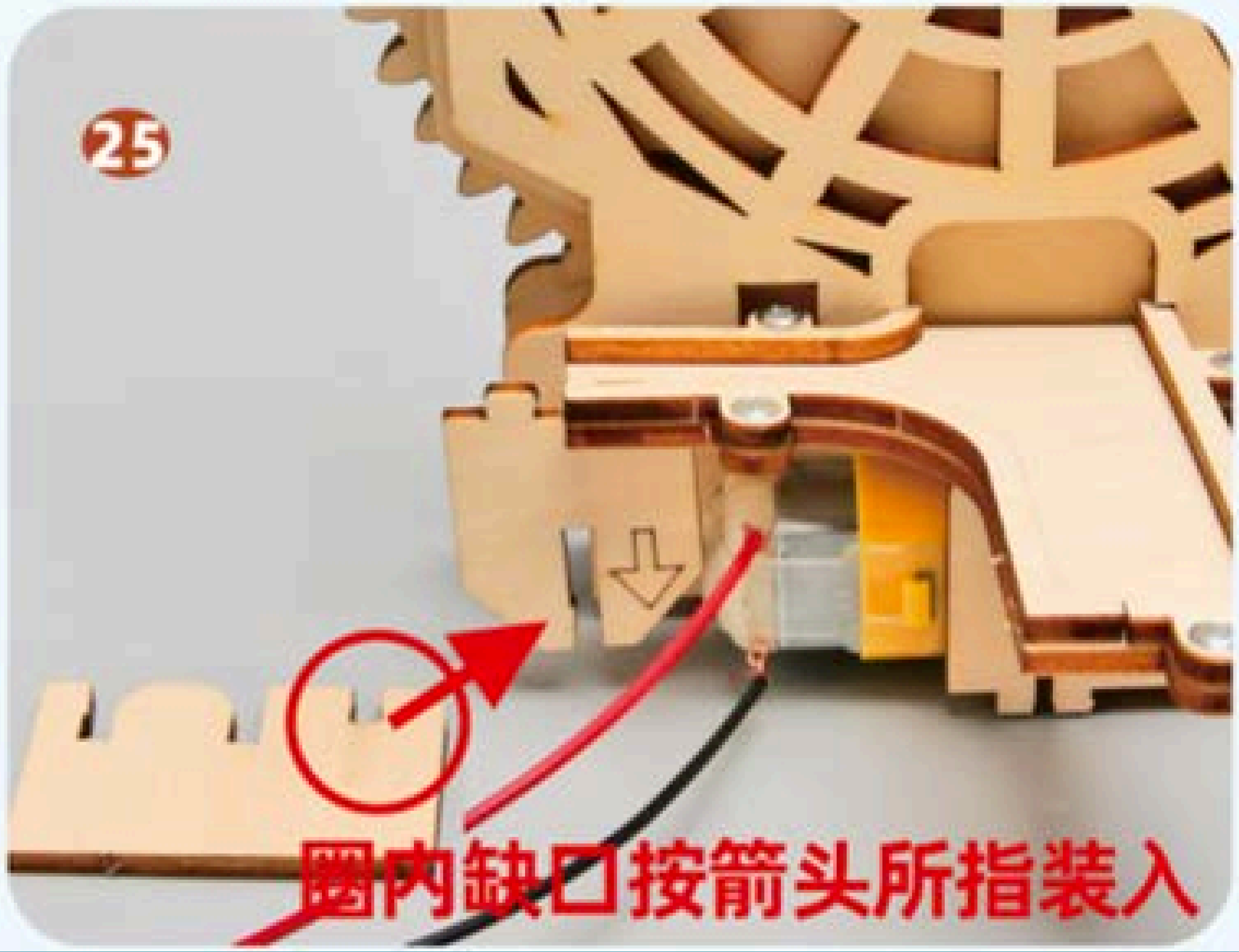
Prepare the next parts and four 6 mm screws.



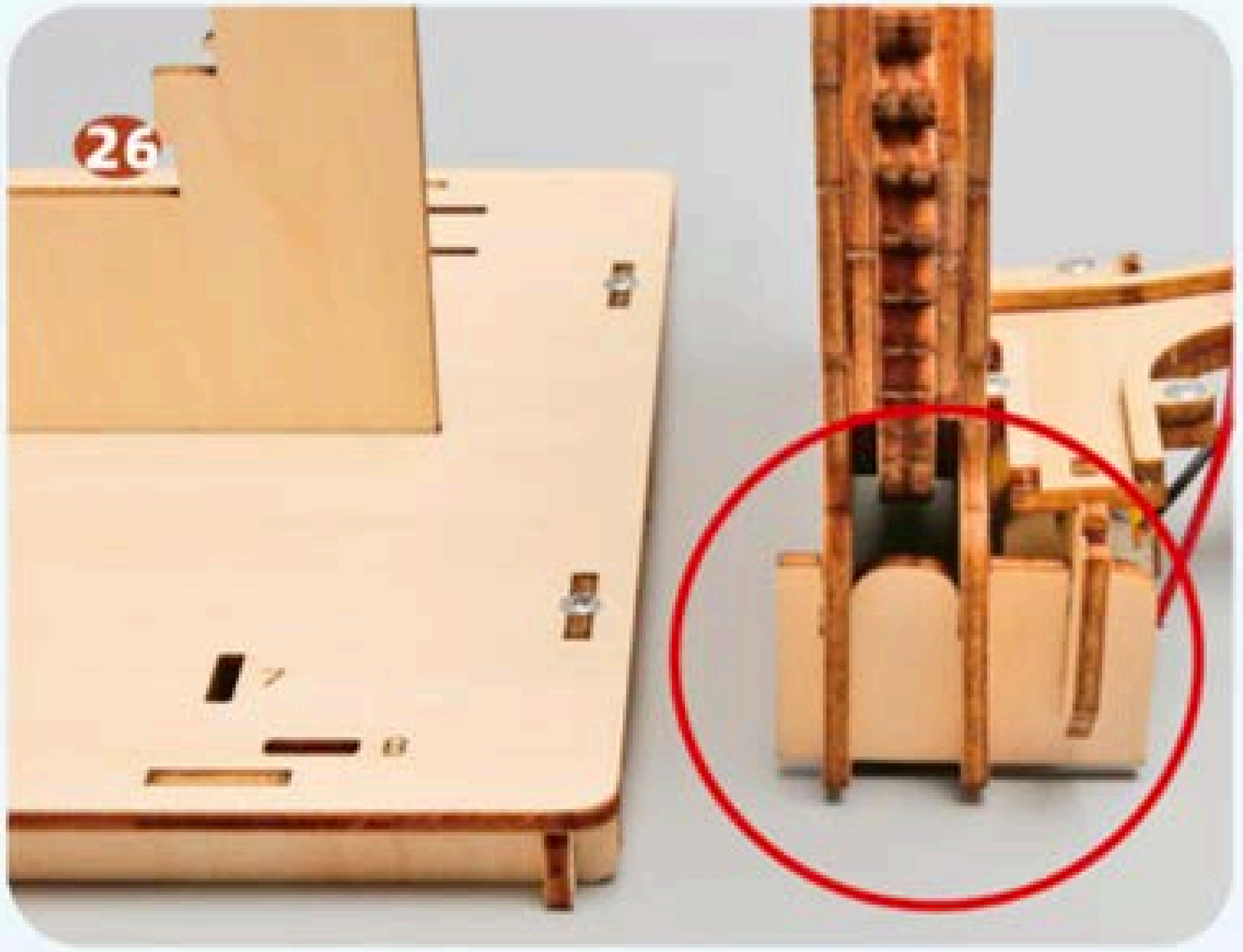
Assemble as shown in the picture and prepare the next parts.

Pay attention: the position of the arrow inside the red circle must face the same direction as shown in the picture.

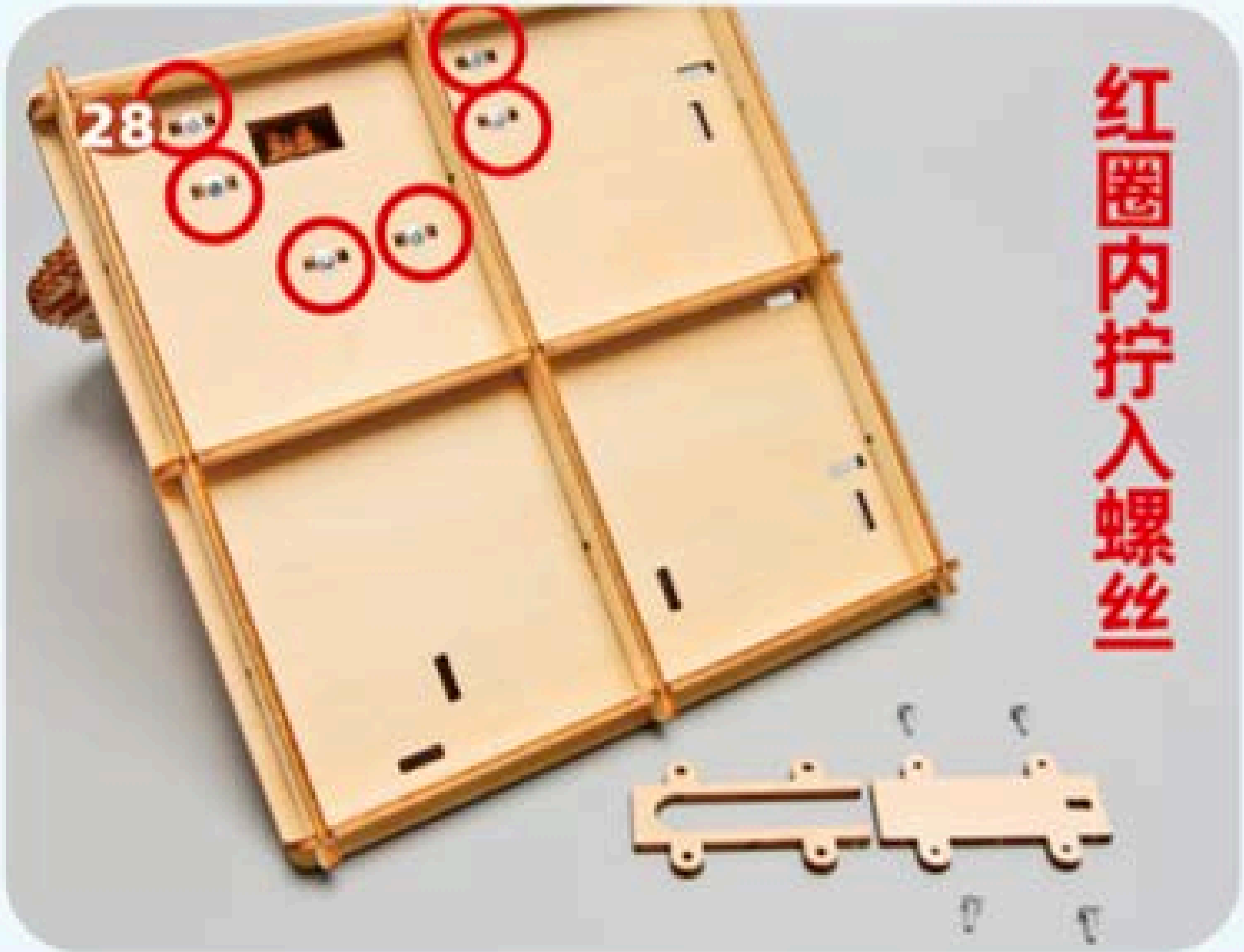
Assemble as shown.



Insert according to the direction indicated by the arrow in the red circle.



Assemble as shown inside the red circle.

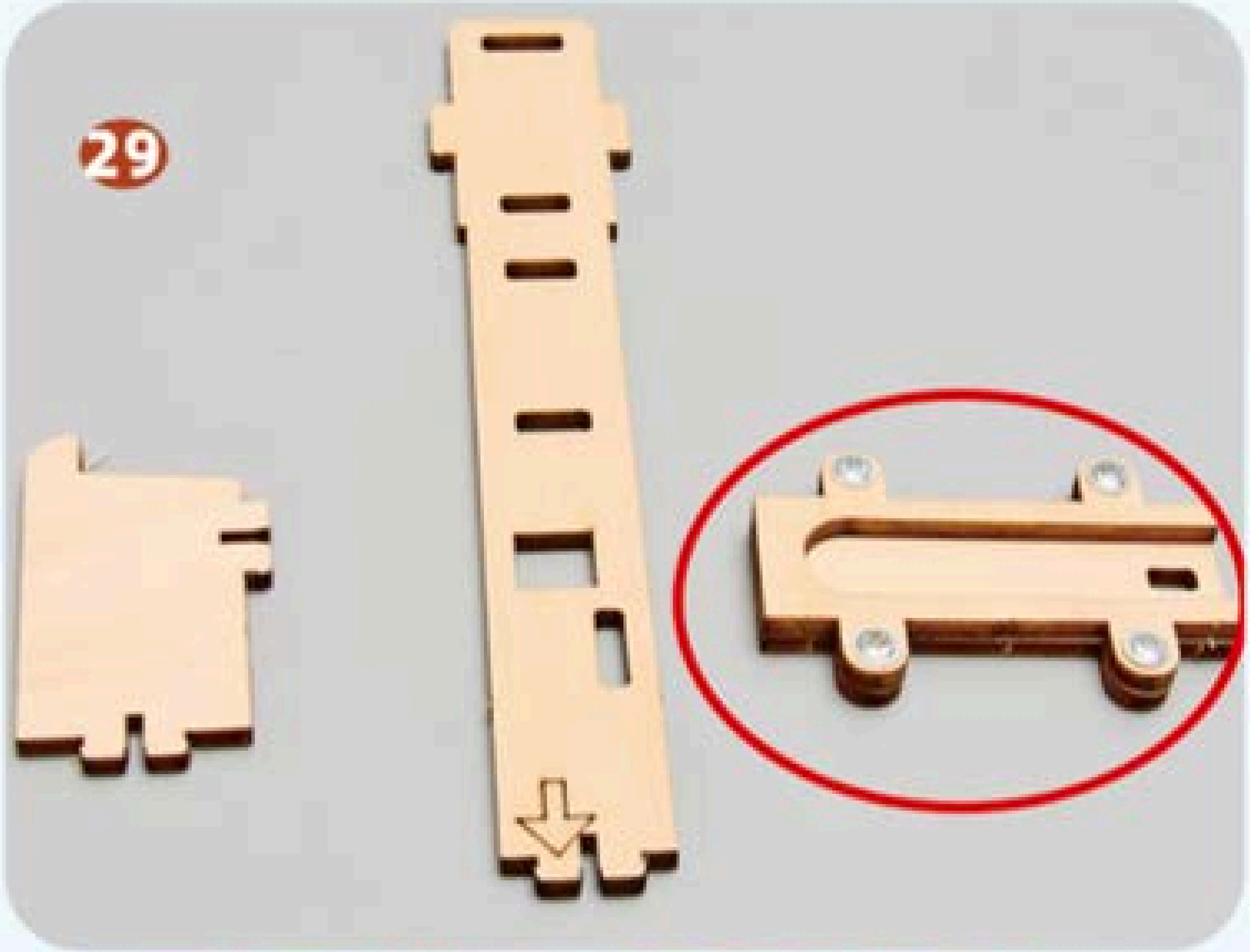


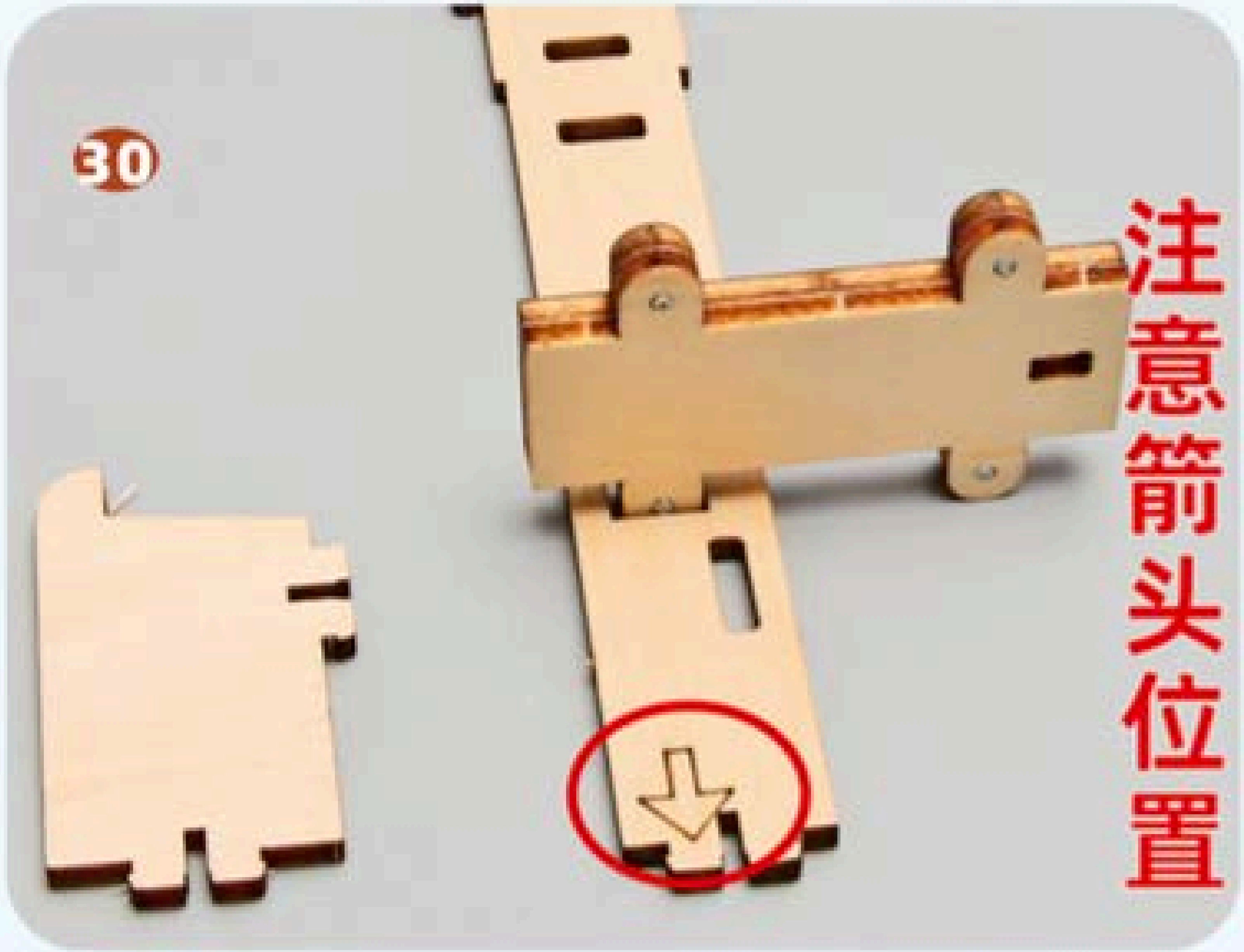
Pay attention: the two arrows need to face each other.

Assemble as shown in the picture and prepare six 6 mm screws.

Insert screws into the red-circled areas.

After inserting the screws as shown, prepare the next parts.

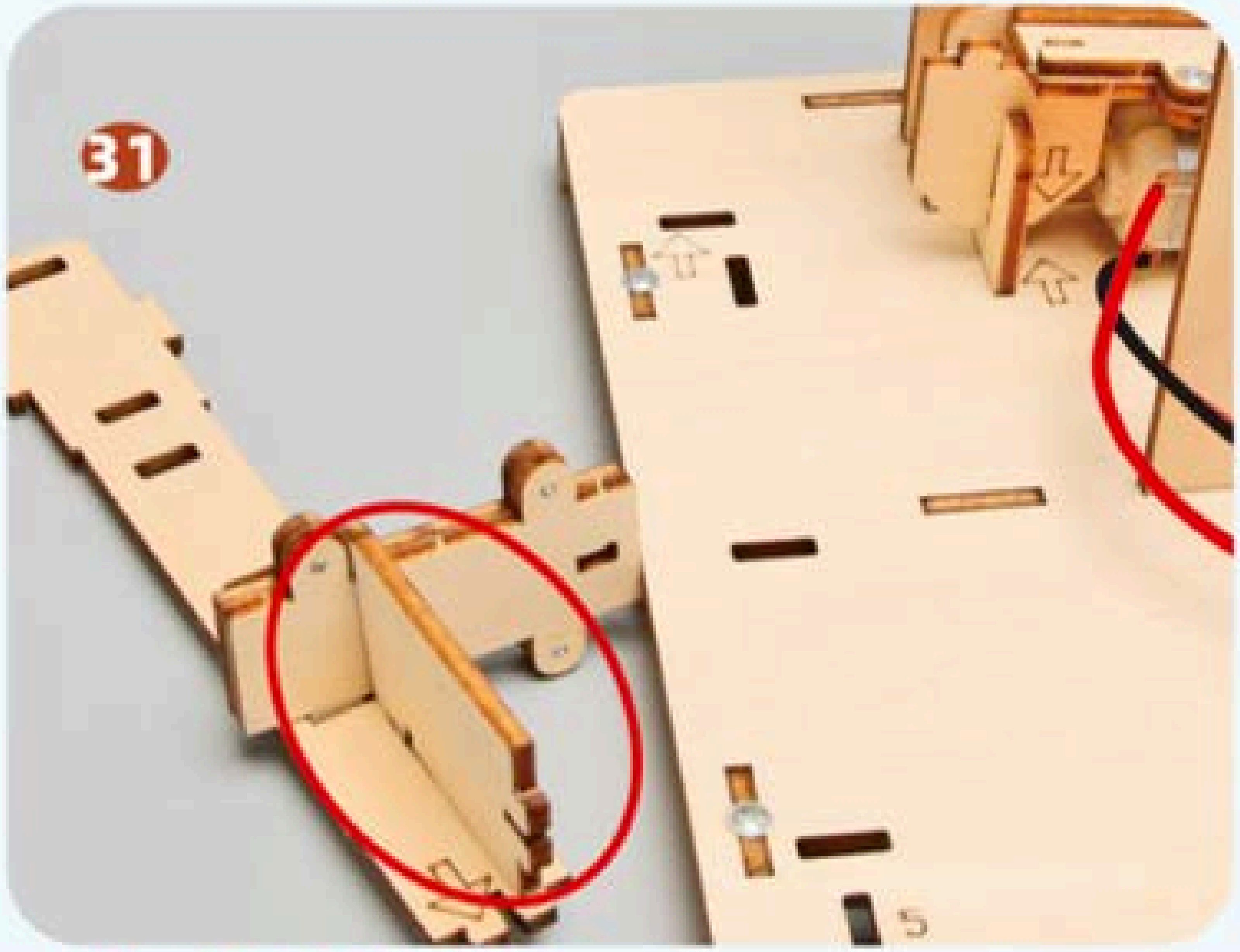


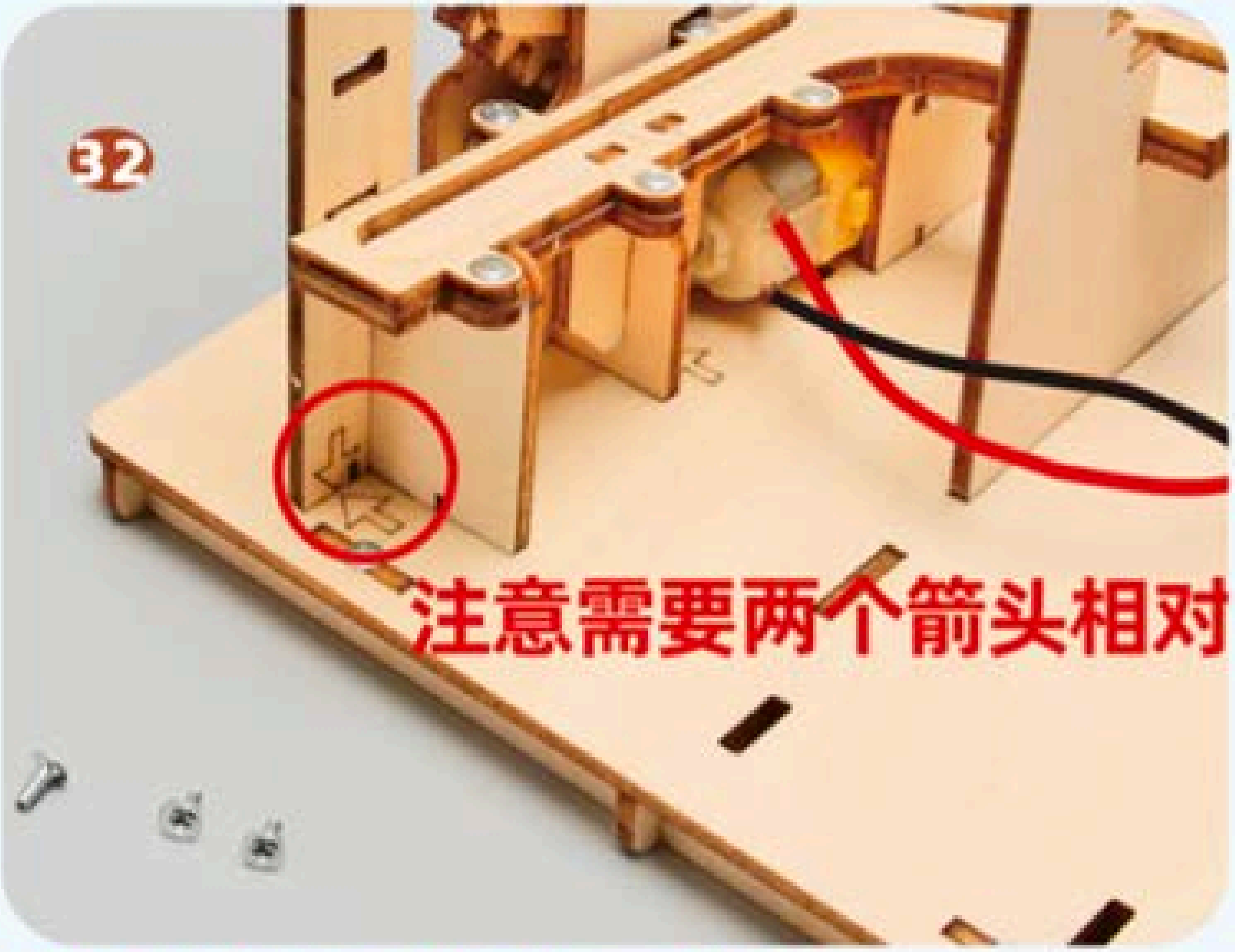


Assemble the parts inside the red circle as shown, and prepare the next components.

Assemble as shown in the picture.

Pay attention to the position of the arrow.





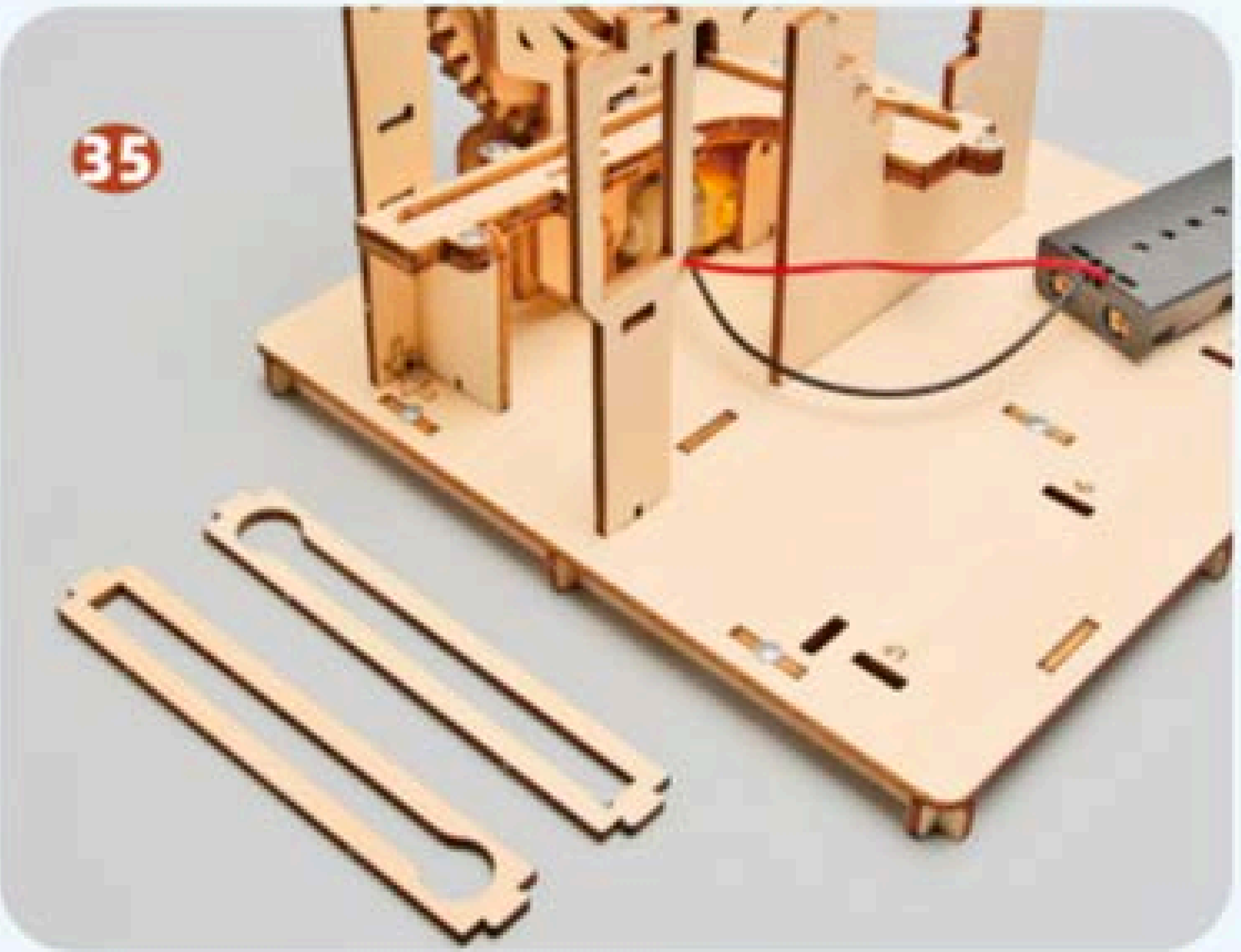
Assemble the part inside the red circle as shown in the picture.

Pay attention: the two arrow need to face each other.

After assembling as shown, prepare three 6 mm screws.

Insert screws into the red-circled areas

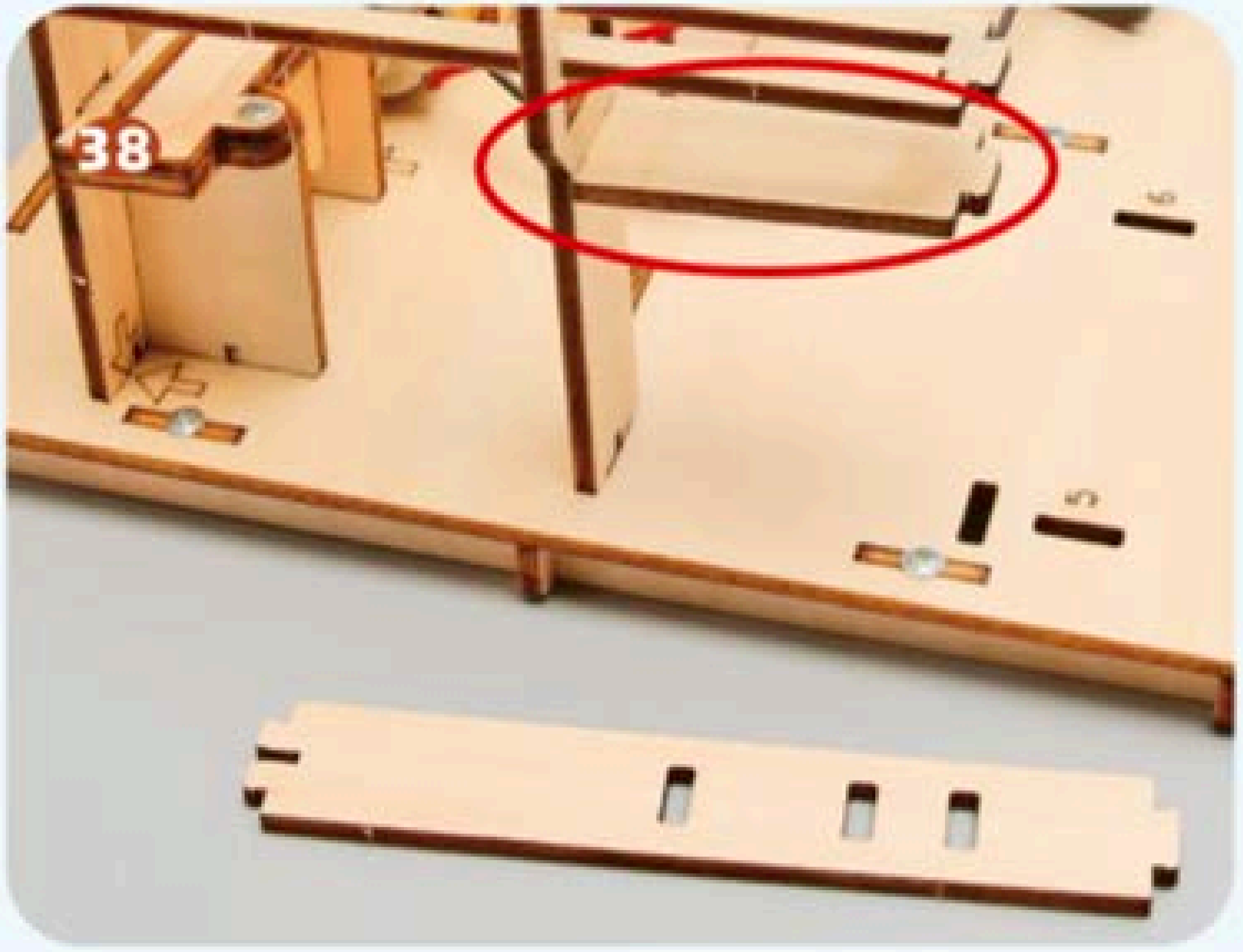
Insert screws into the red-circled areas.
After tightening the screws, prepare the next parts.



Assemble as shown in the picture and prepare the next parts.

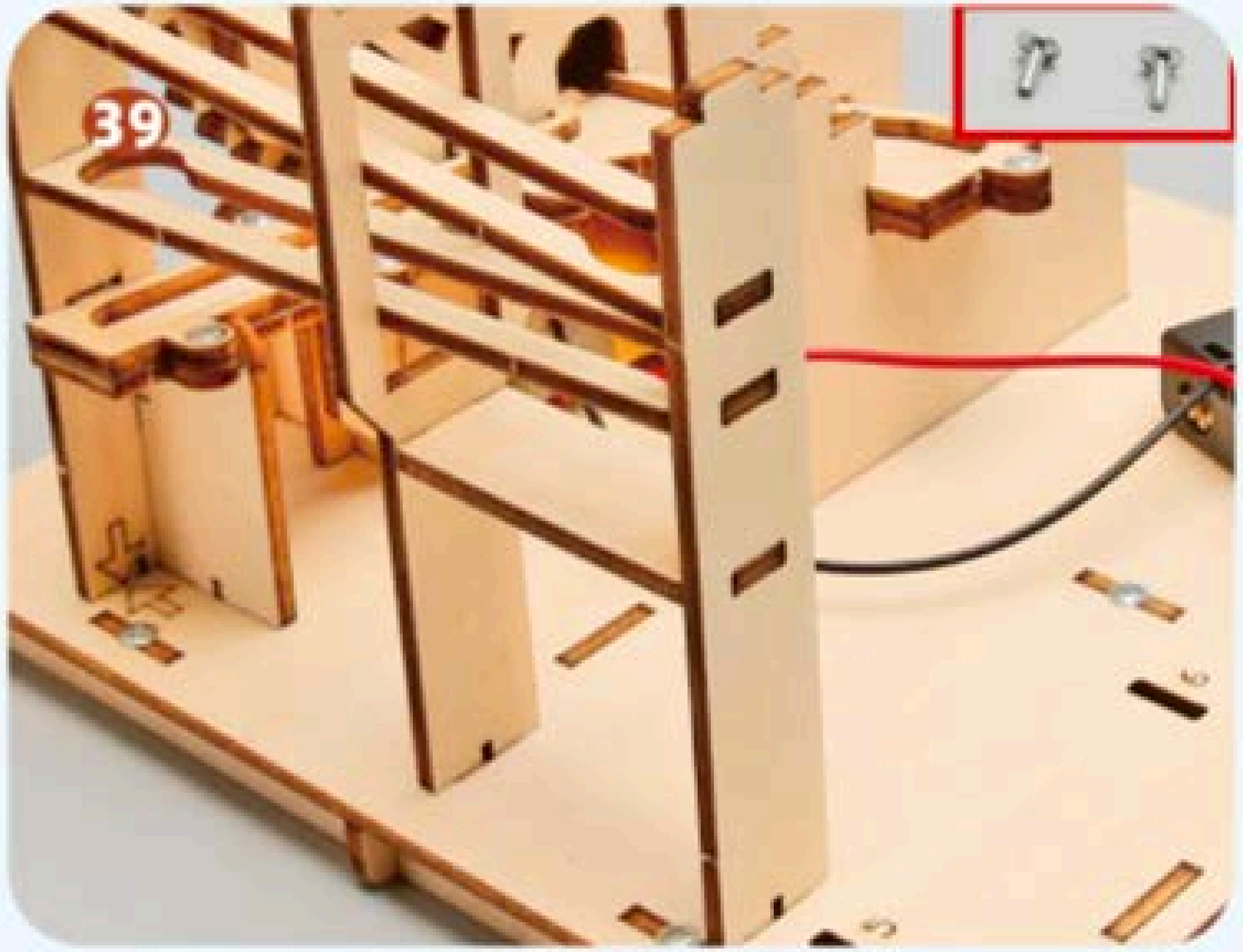
Pay attention to the direction indicated by red circle.

Assemble as shown in the picture.



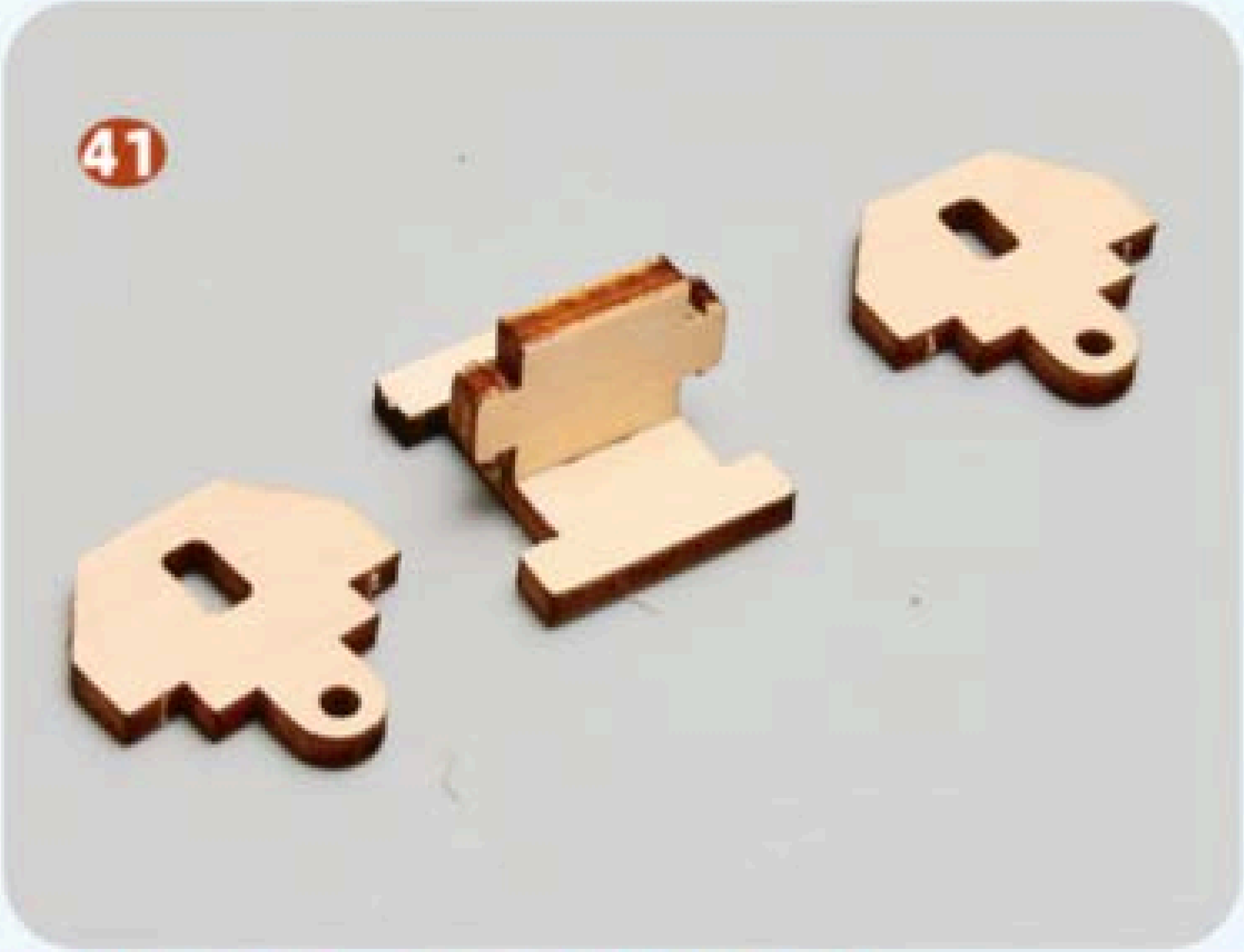
Pay attention to the direction of the round end.
Assemble as shown in the picture and prepare next parts as upper right corner.

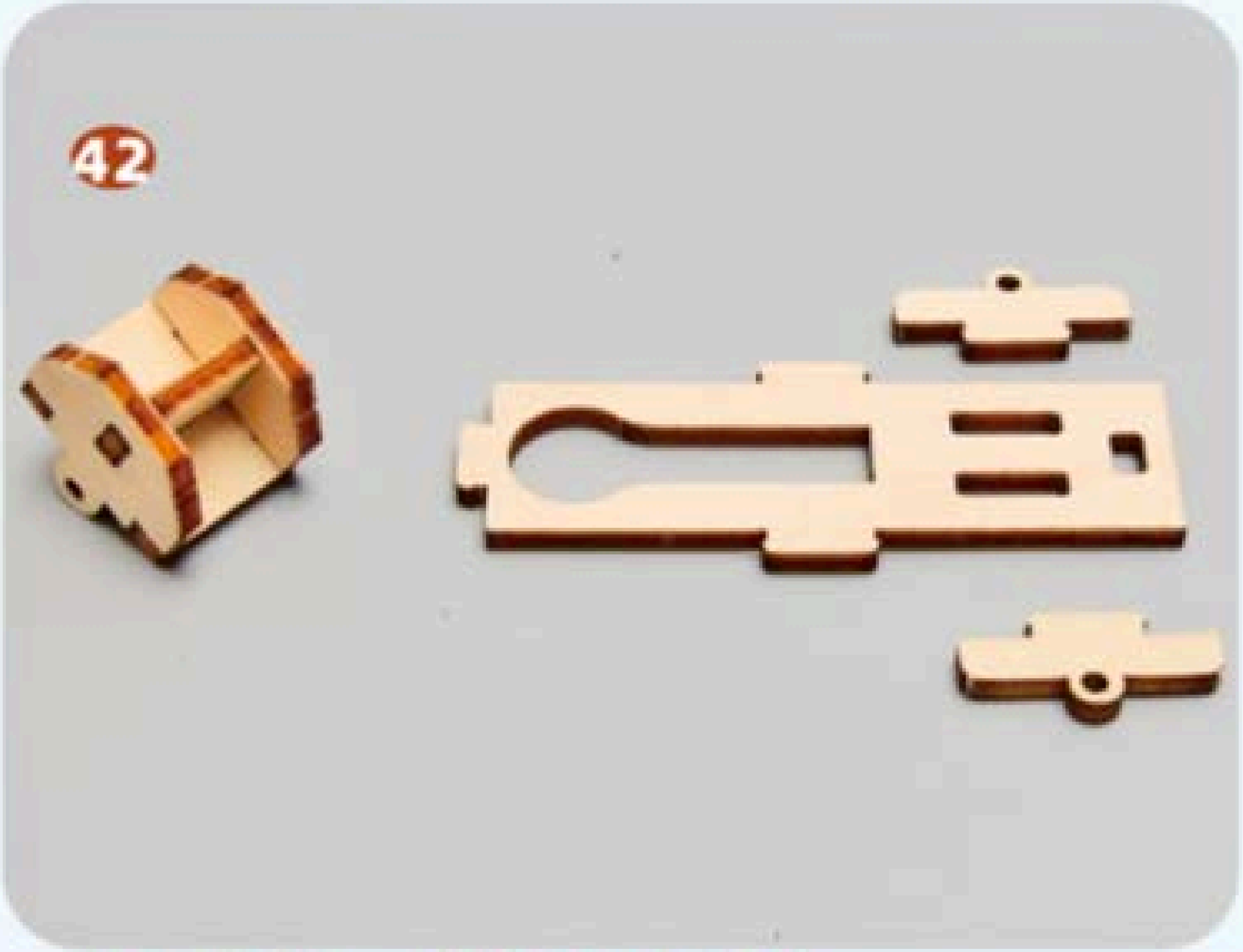
Insert the wooden piece as shown in the picture and prepare the next parts.



Assemble as shown in the picture and prepare two 6 mm screws.

Insert screws into the red-circled areas as shown, and prepare the next parts.





Assemble as shown in the picture and prepare the next parts.

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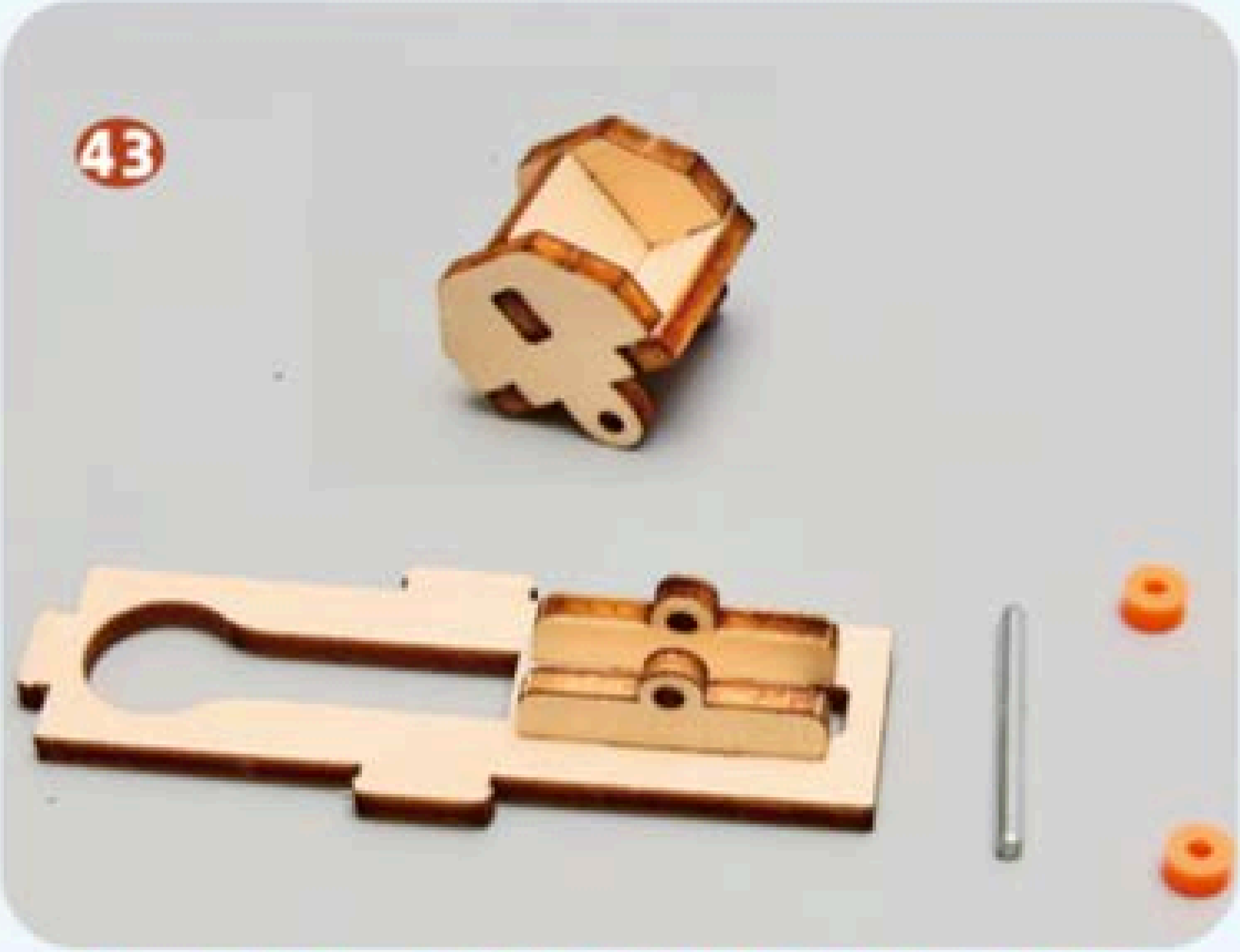
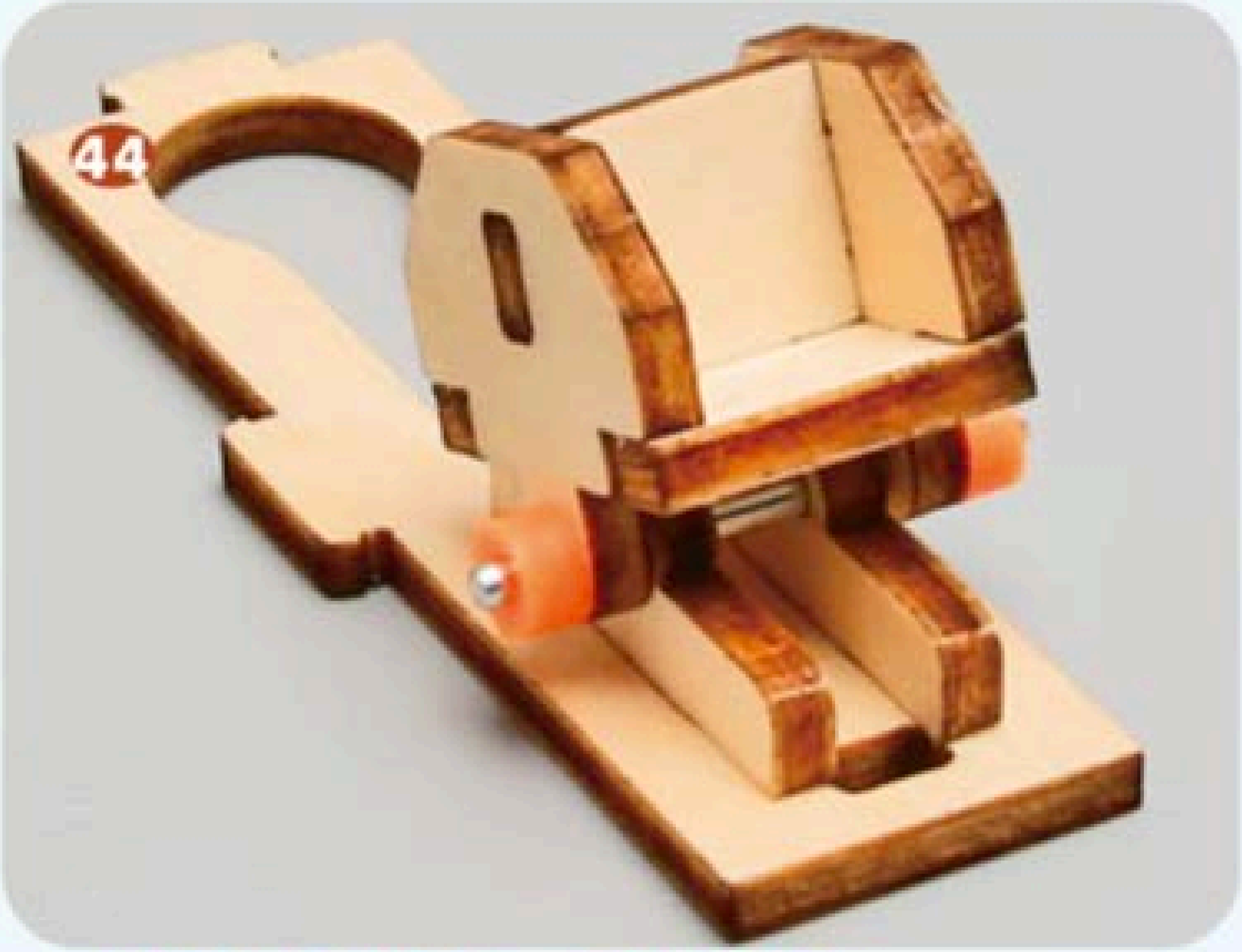
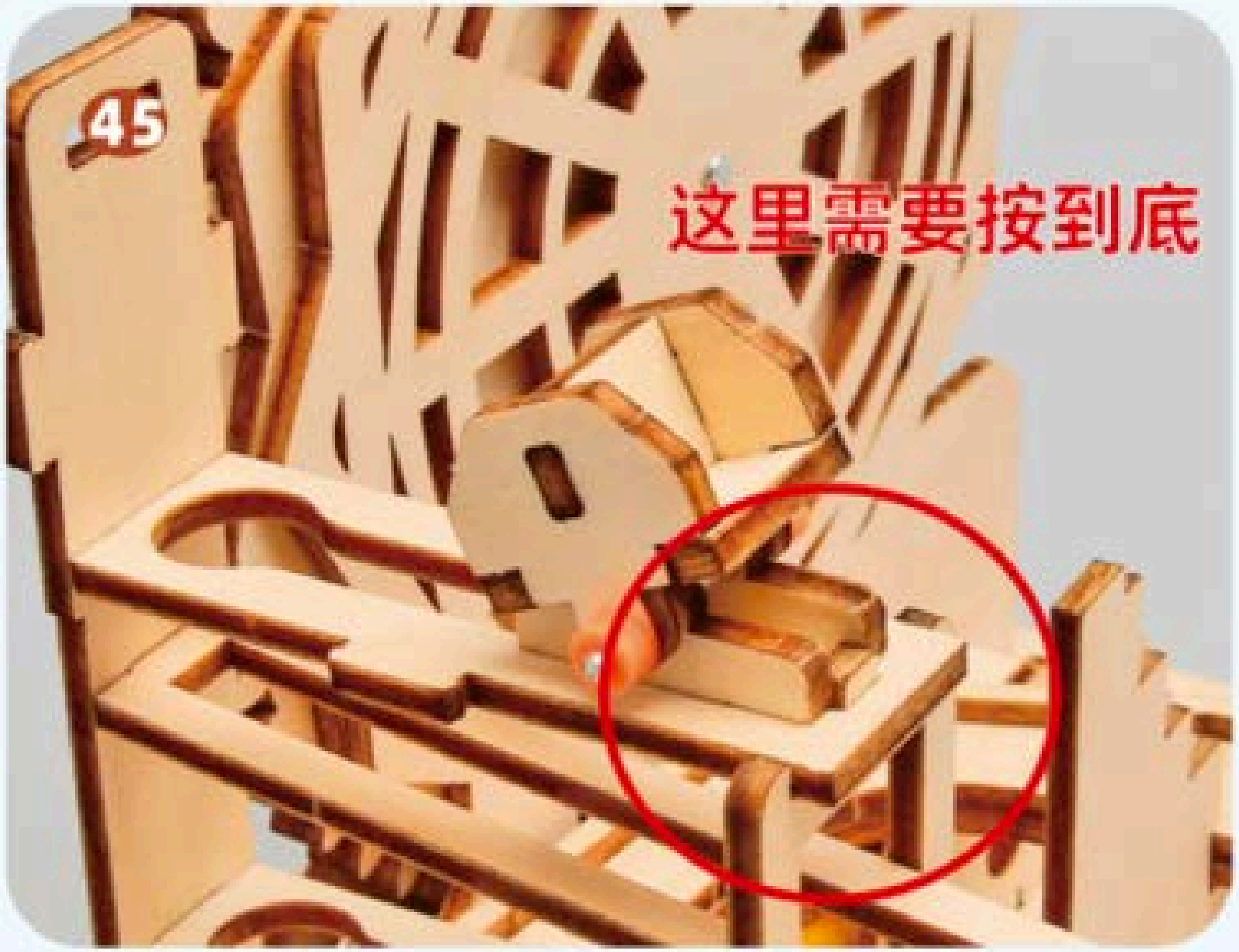




Assemble as shown in the picture. Prepare a 25 mm shaft and shaft sleeve.

Insert the shaft as shown in the picture and attach the shaft sleeve.

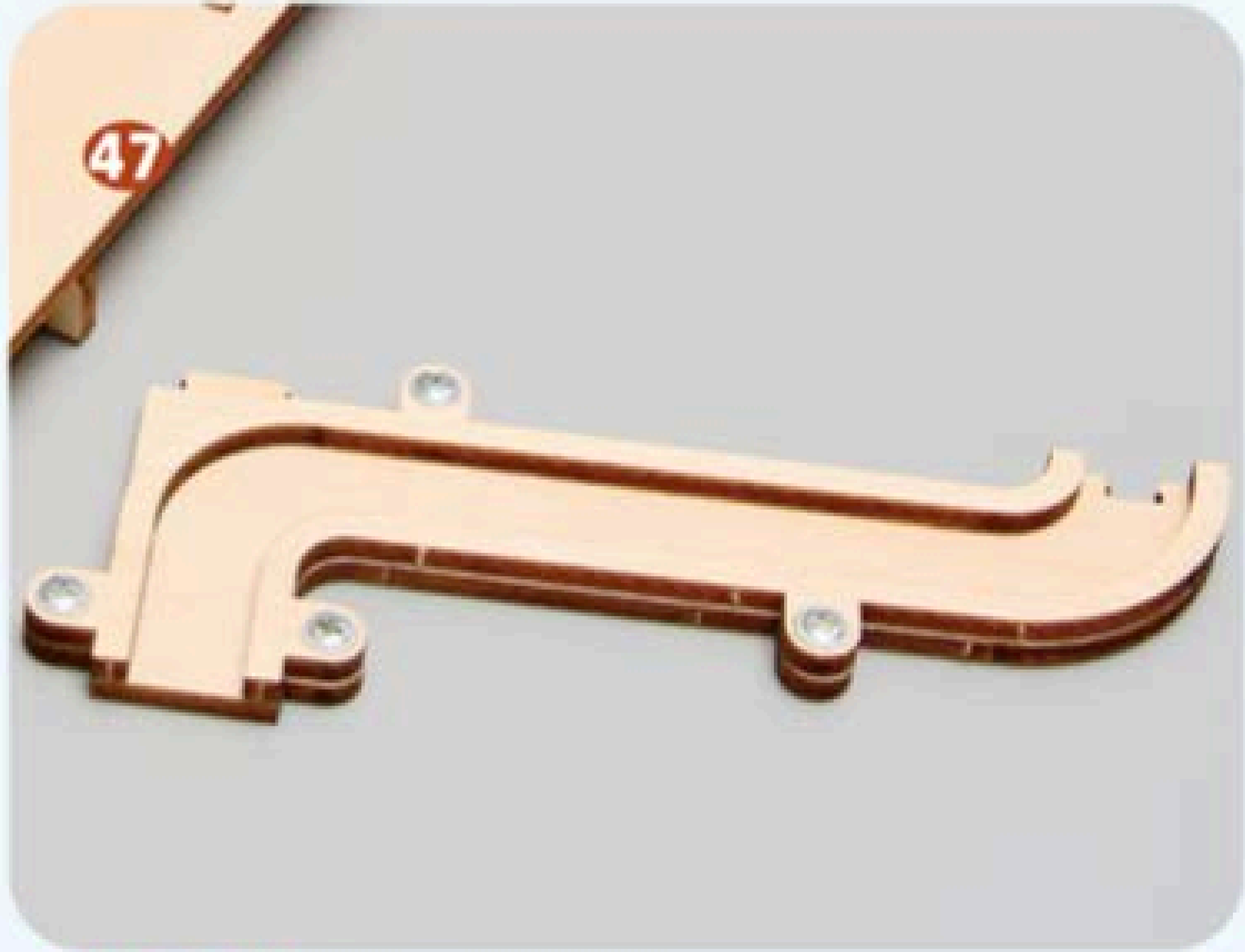


Press this part all the way down in the red circle area.

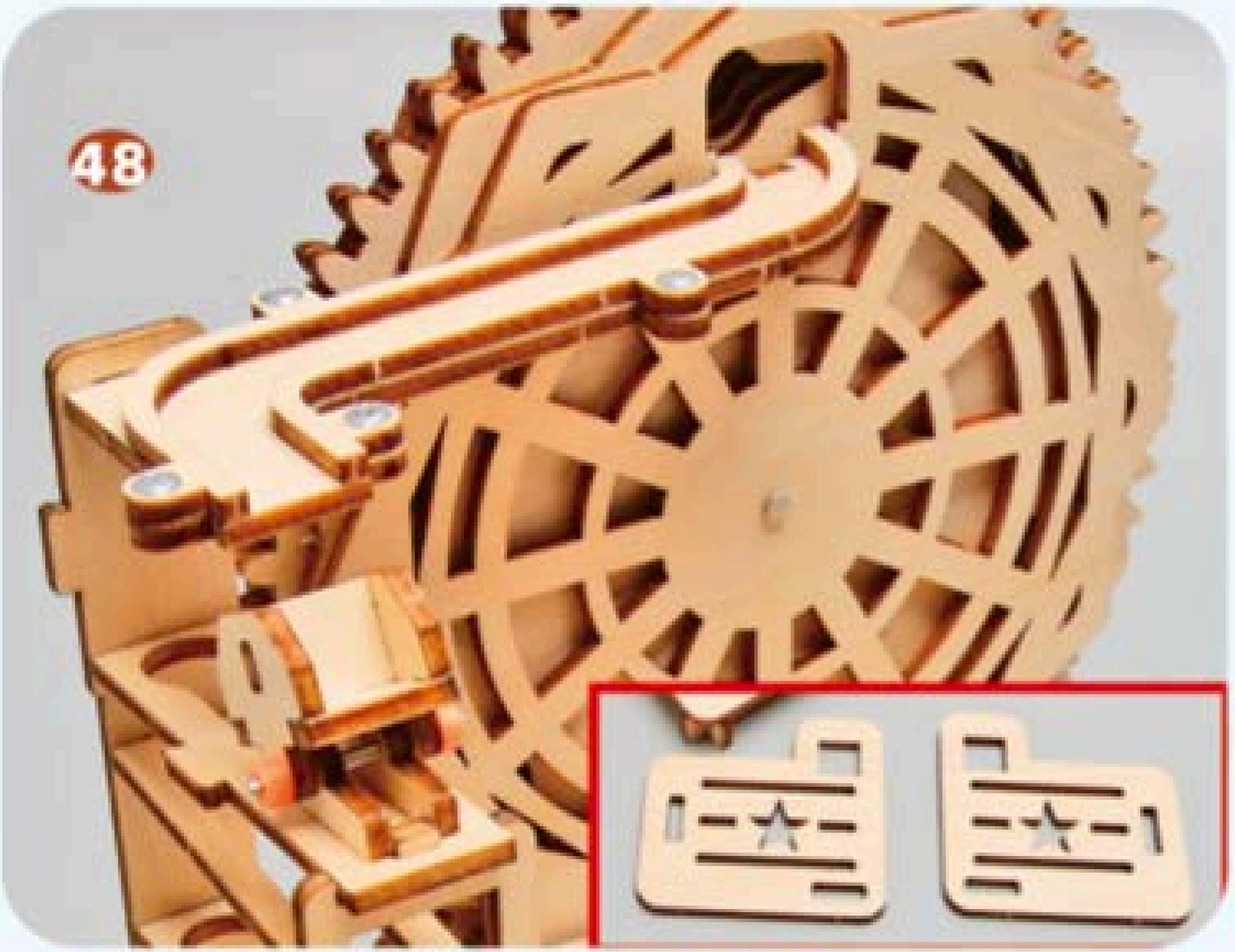
Assemble as shown in the picture.

Prepare the parts and four 6 mm screws

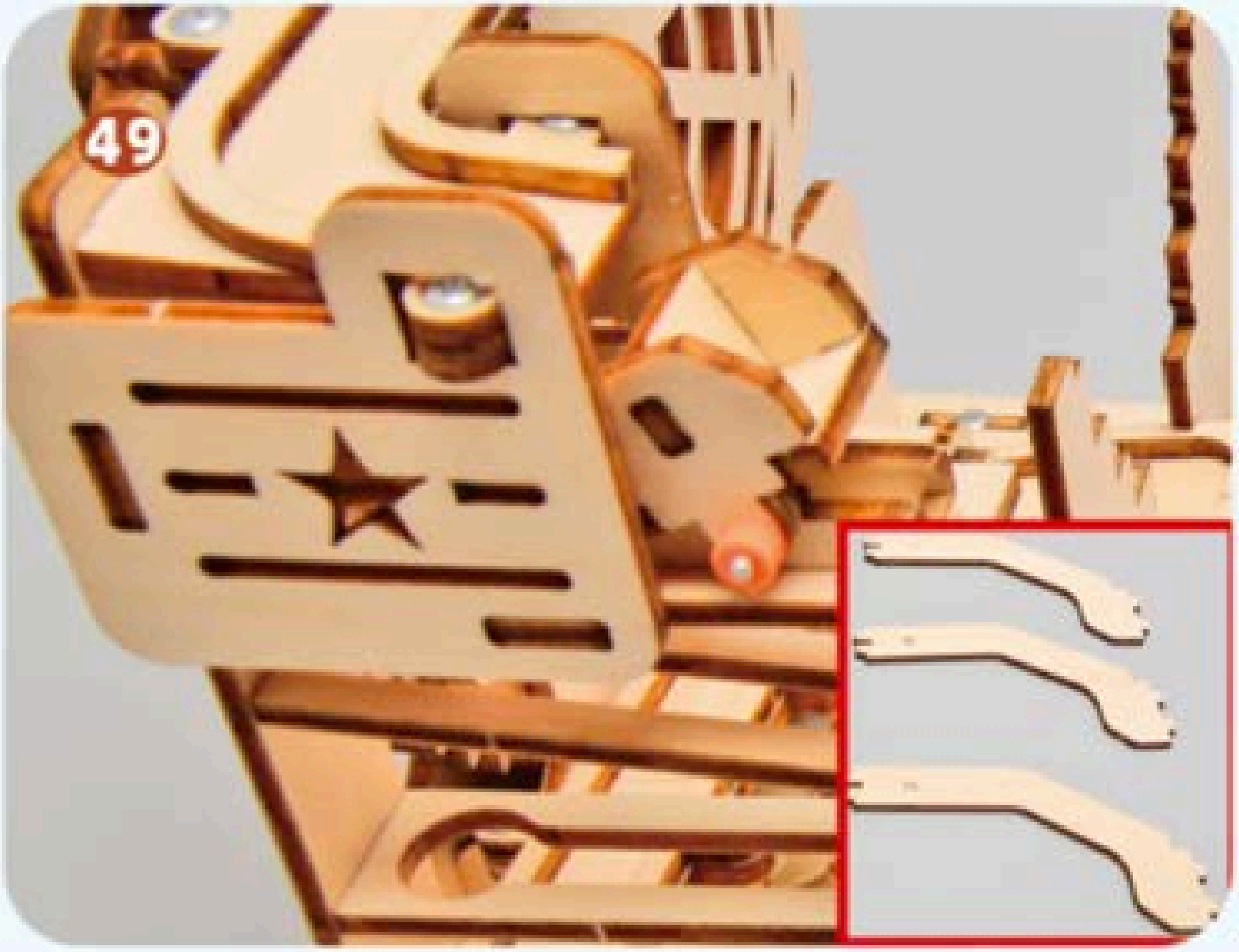
Make sure the placement and orientation match the picture.



Tighten the screws.



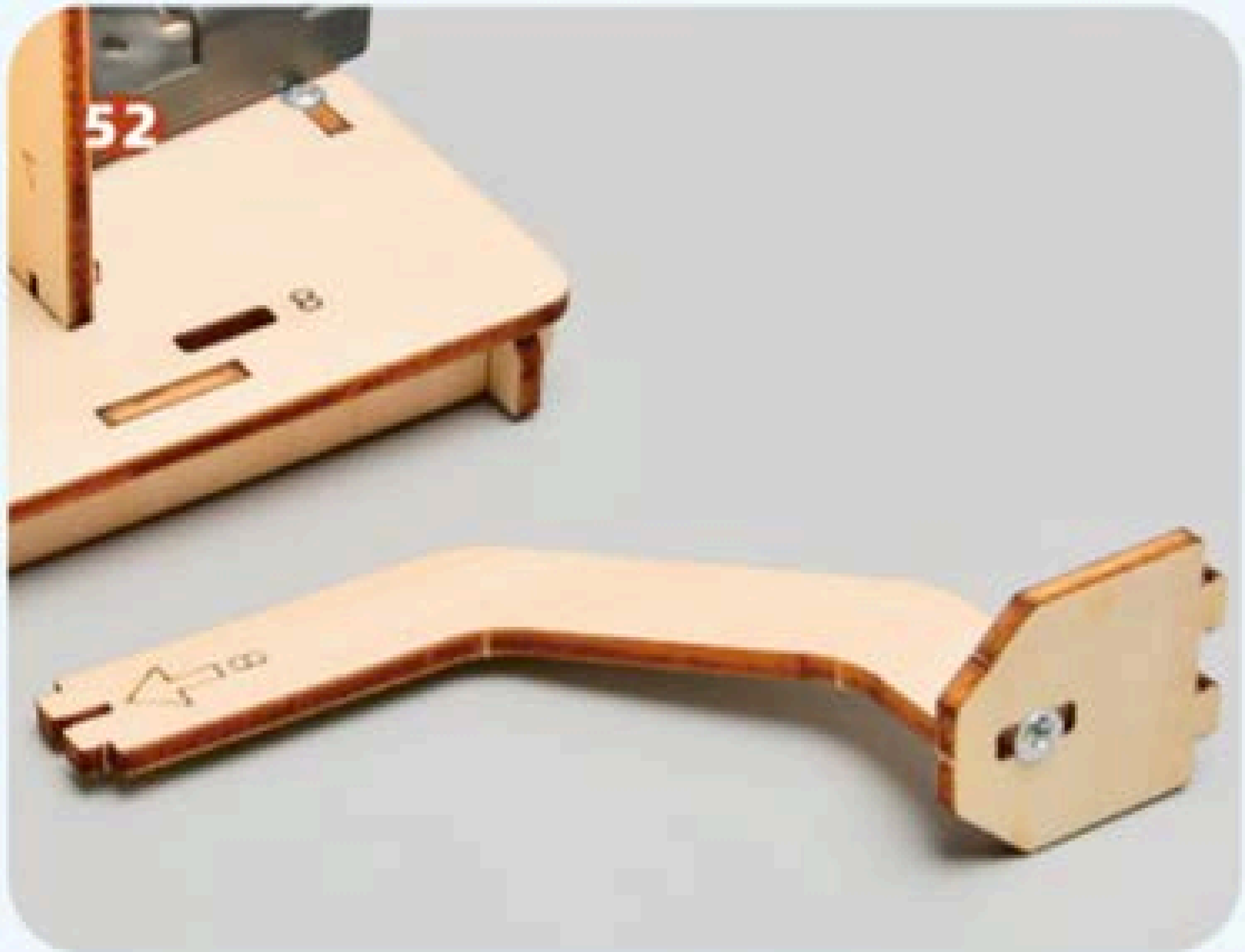
Assemble as shown in the picture and prepare the parts shown in the lower right corner.



Assemble as shown in the picture and prepare the parts shown in the lower right corner.

Match the numbers inside the red circle with the corresponding numbers on the base and insert.

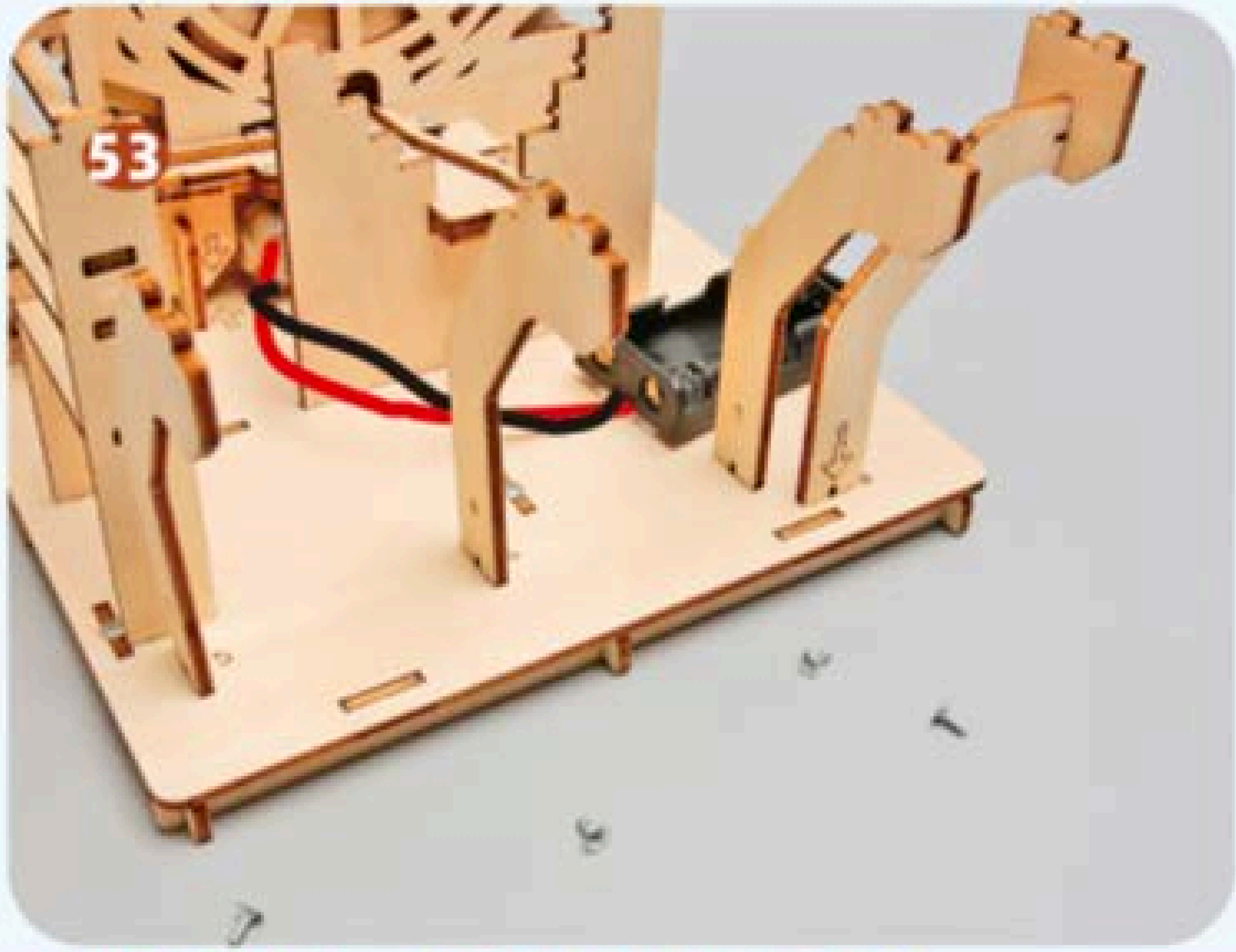
Assemble as shown in the picture and prepare the next parts.



Pay attention to the direction arrow.

Assemble as shown in the picture and prepare one 6 mm screw.

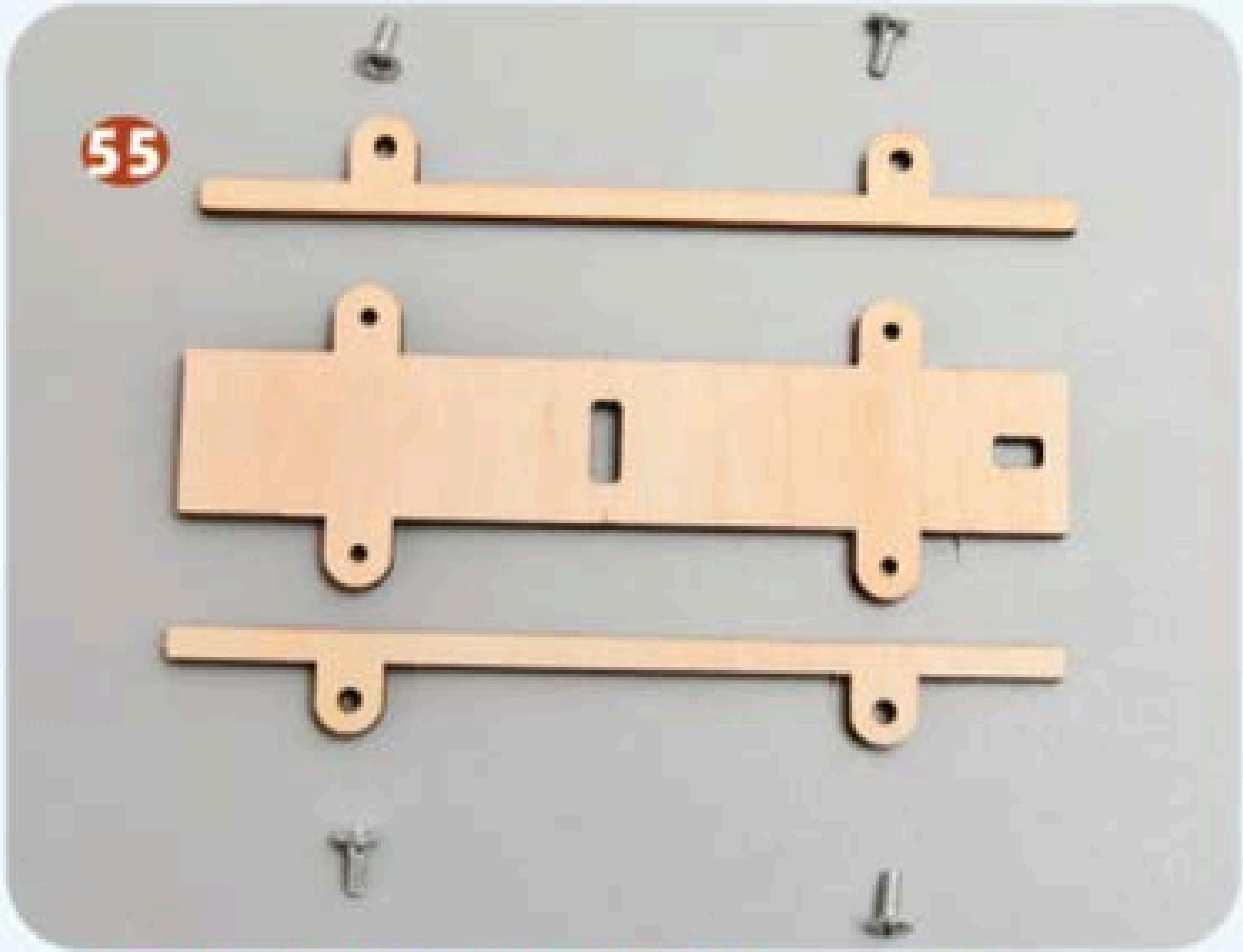
As shown in the picture, insert and tighten the screw.



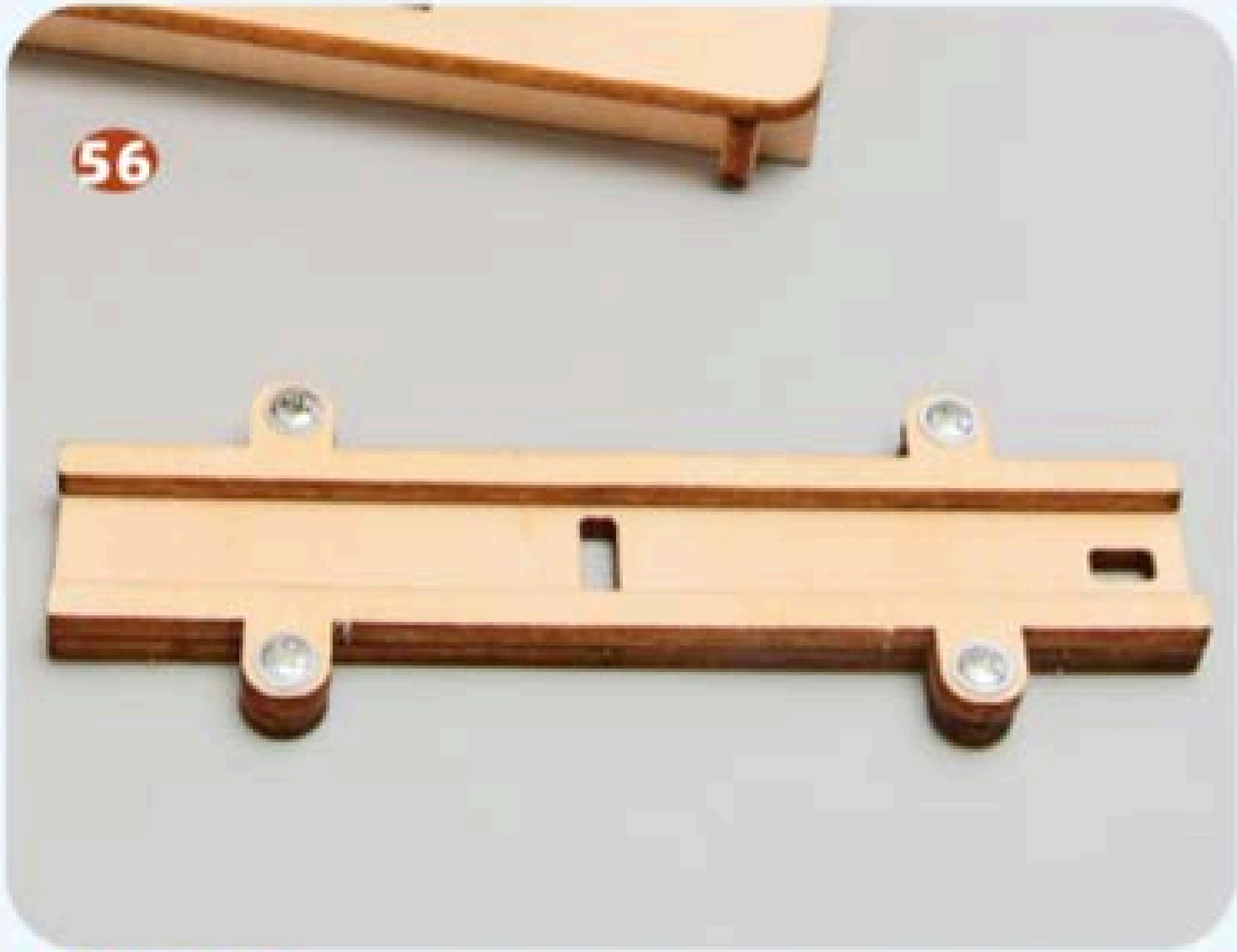
Install the battery box as shown in the picture and prepare the next parts.

Prepare four 6 mm screws.

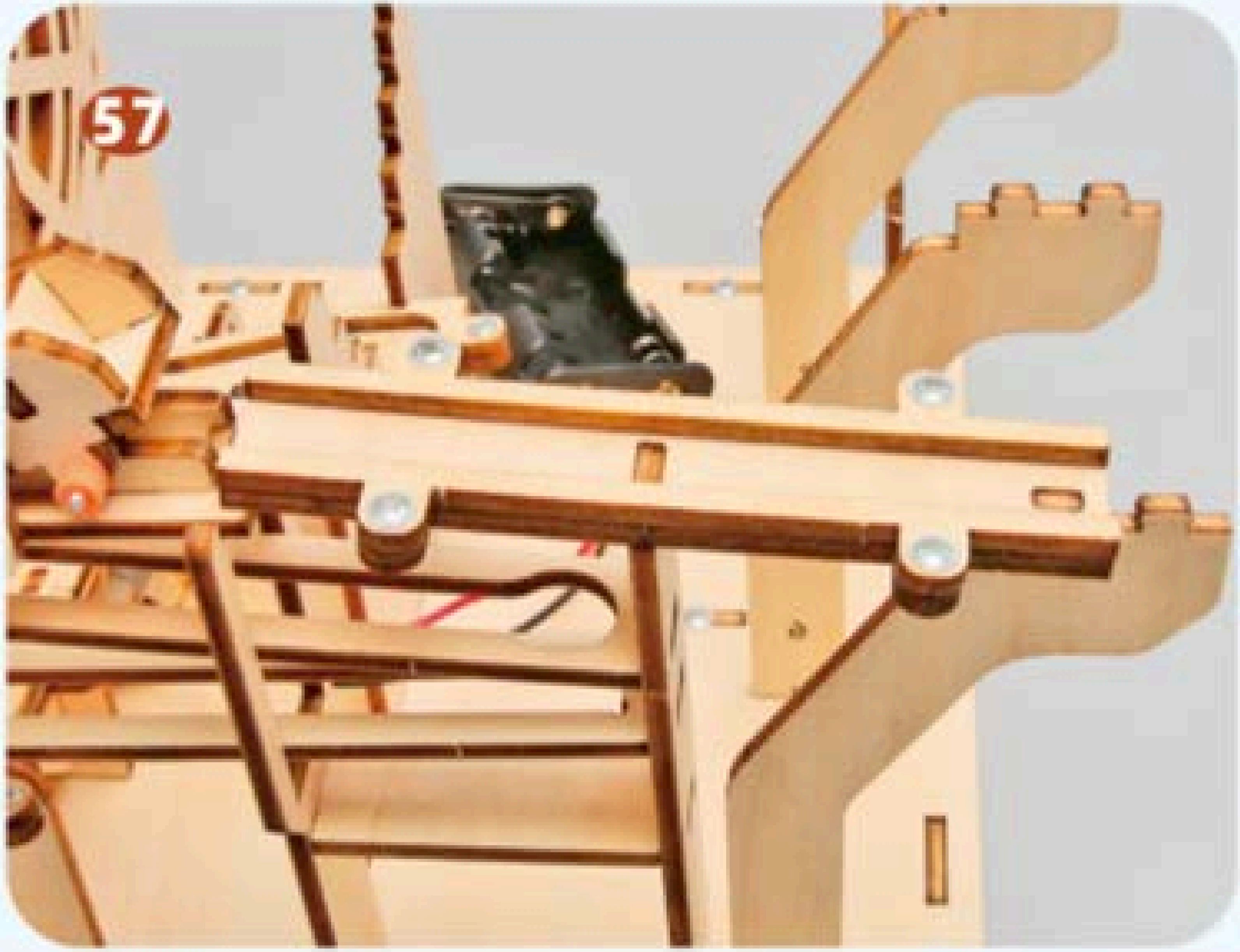
Insert screws into the areas marked with red circles.

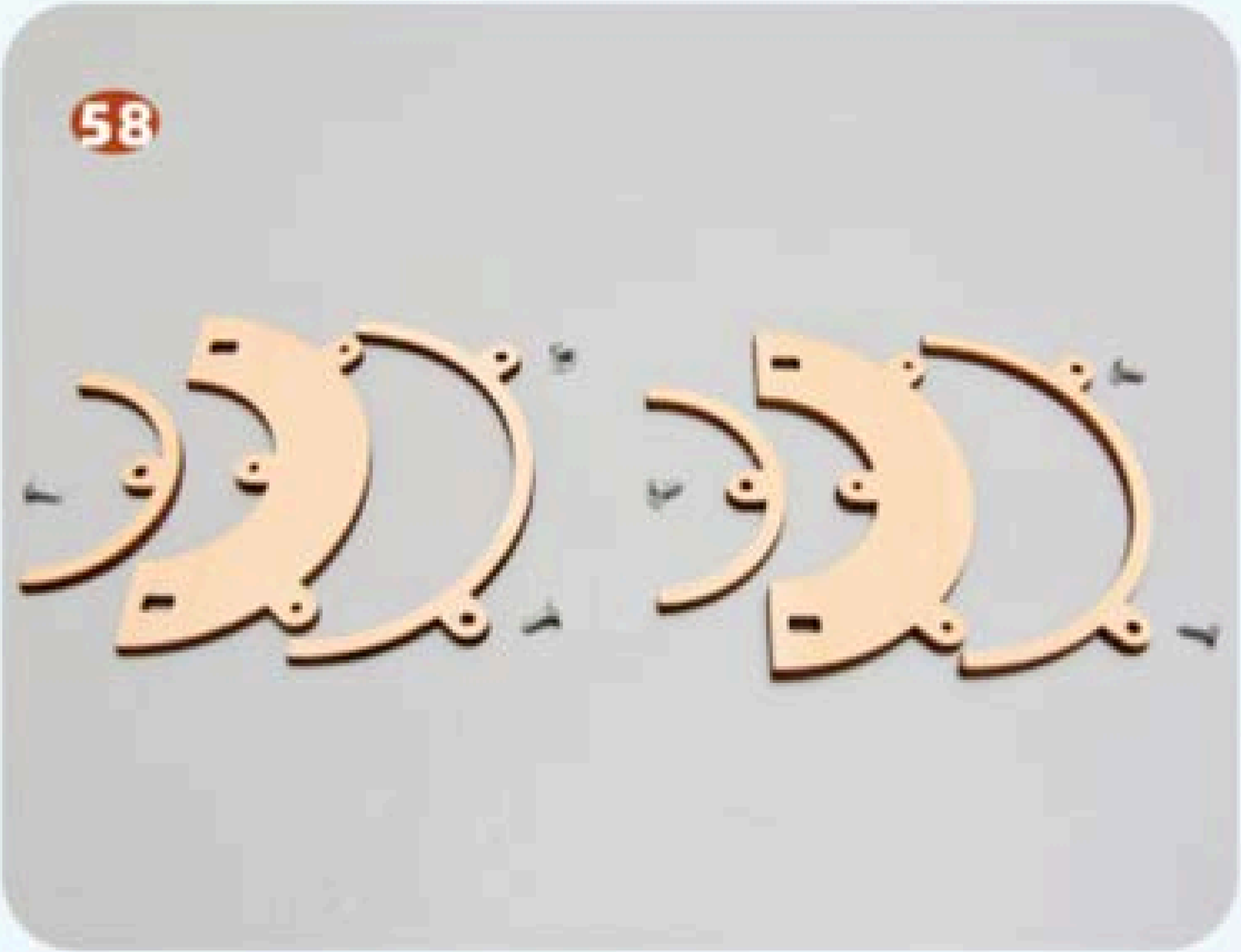


Prepare the parts and four 6 mm screws as shown in the picture.



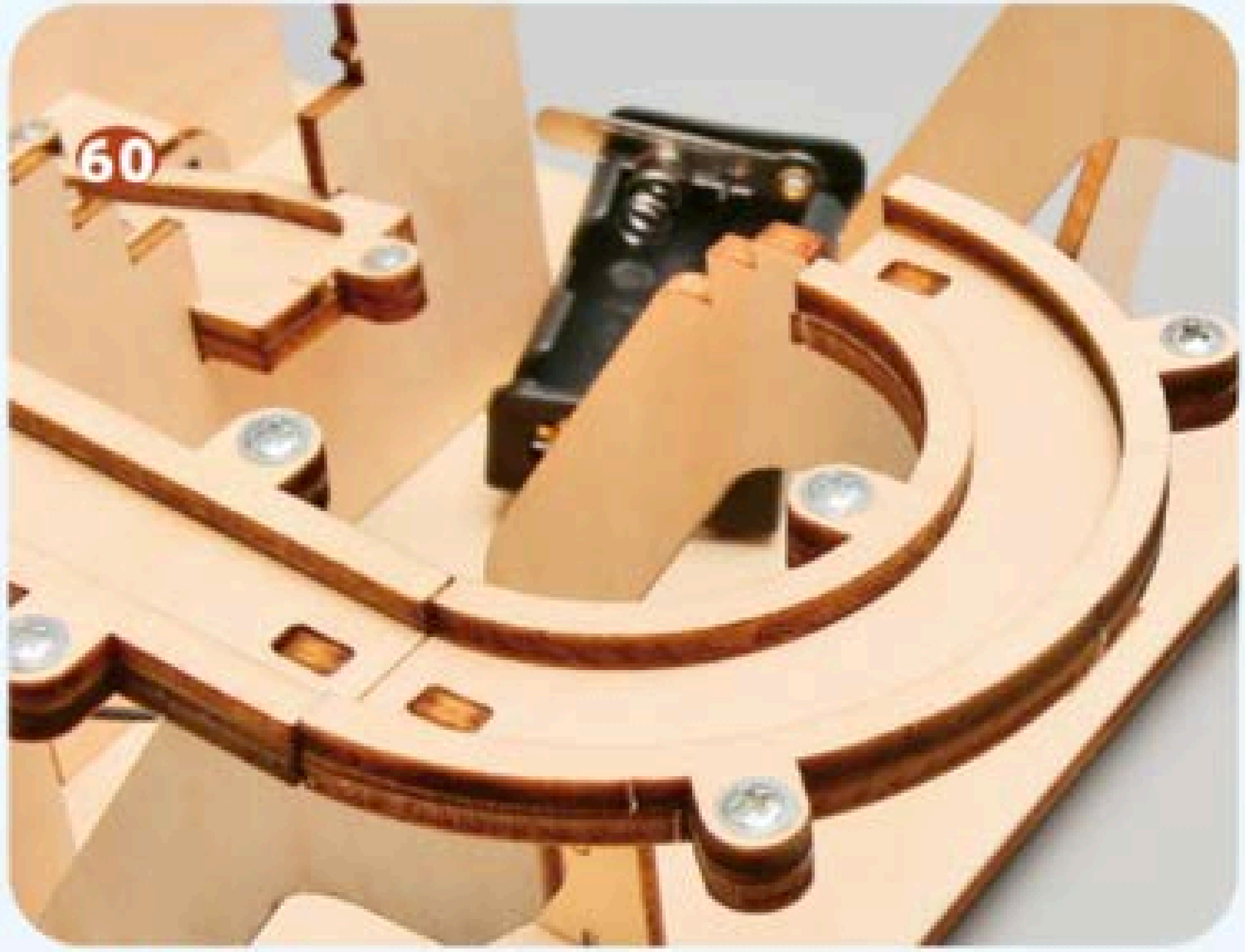
Assemble as shown in the picture.





Assemble as shown in the picture.

Prepare the parts and six 6 mm screws as shown in the picture.



Assemble as shown in the picture.

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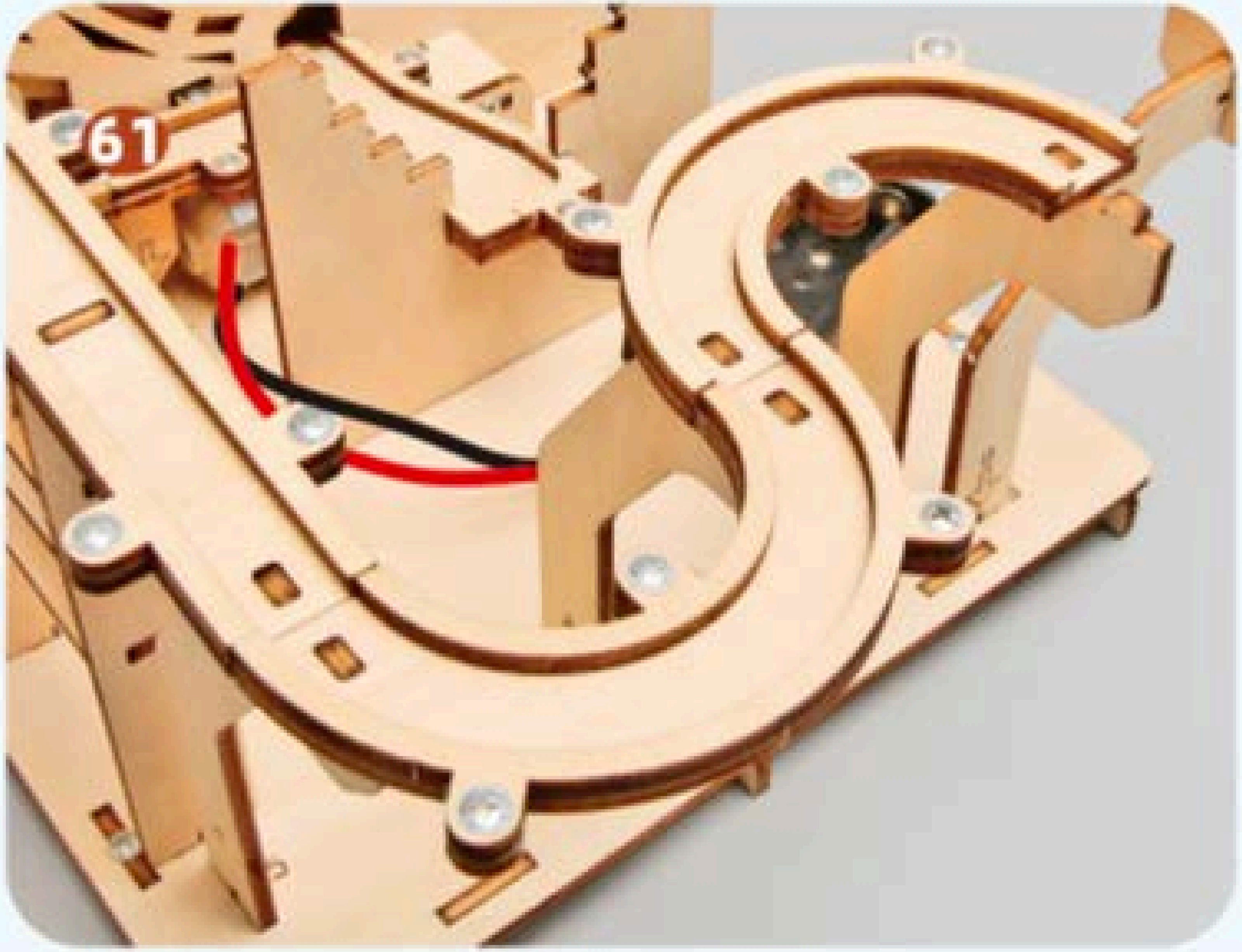


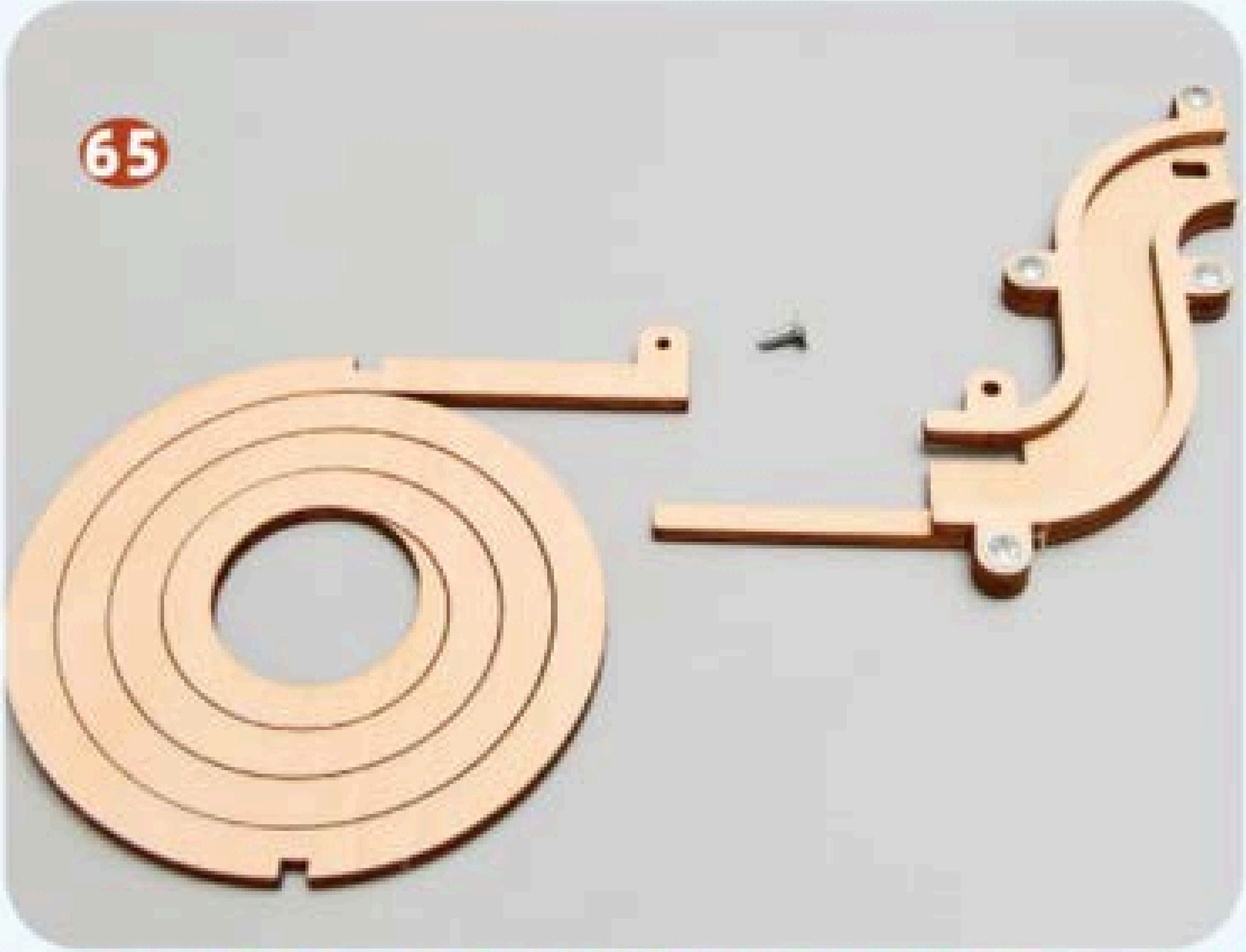
Assemble as shown in the picture.

Prepare the parts and four 6 mm screws as shown.
Placement must match the direction shown in the picture.

Assemble as shown in the picture, then attach it as shown on the right.

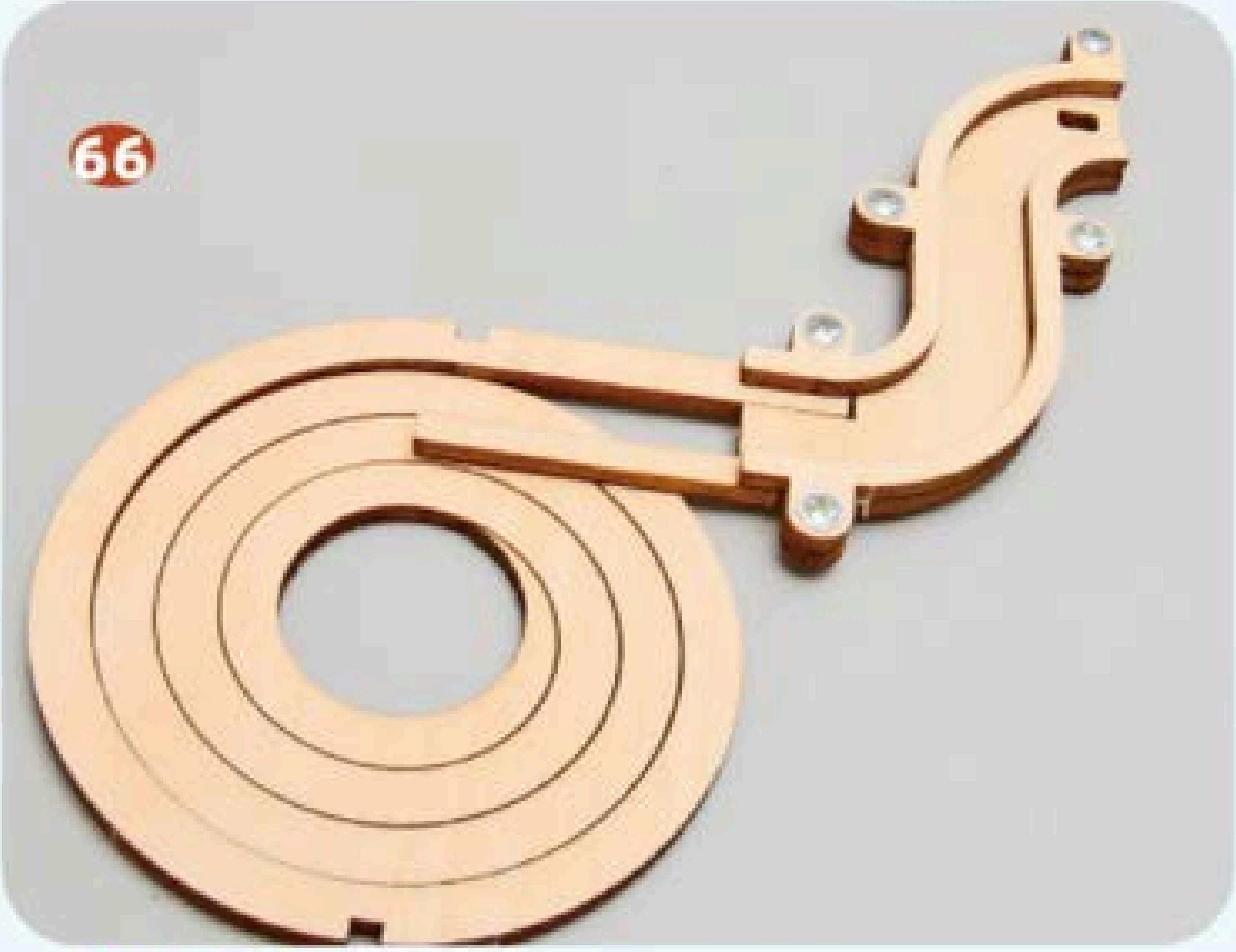
Prepare the parts and four 6 mm screws as shown.

The placement direction must match the picture.



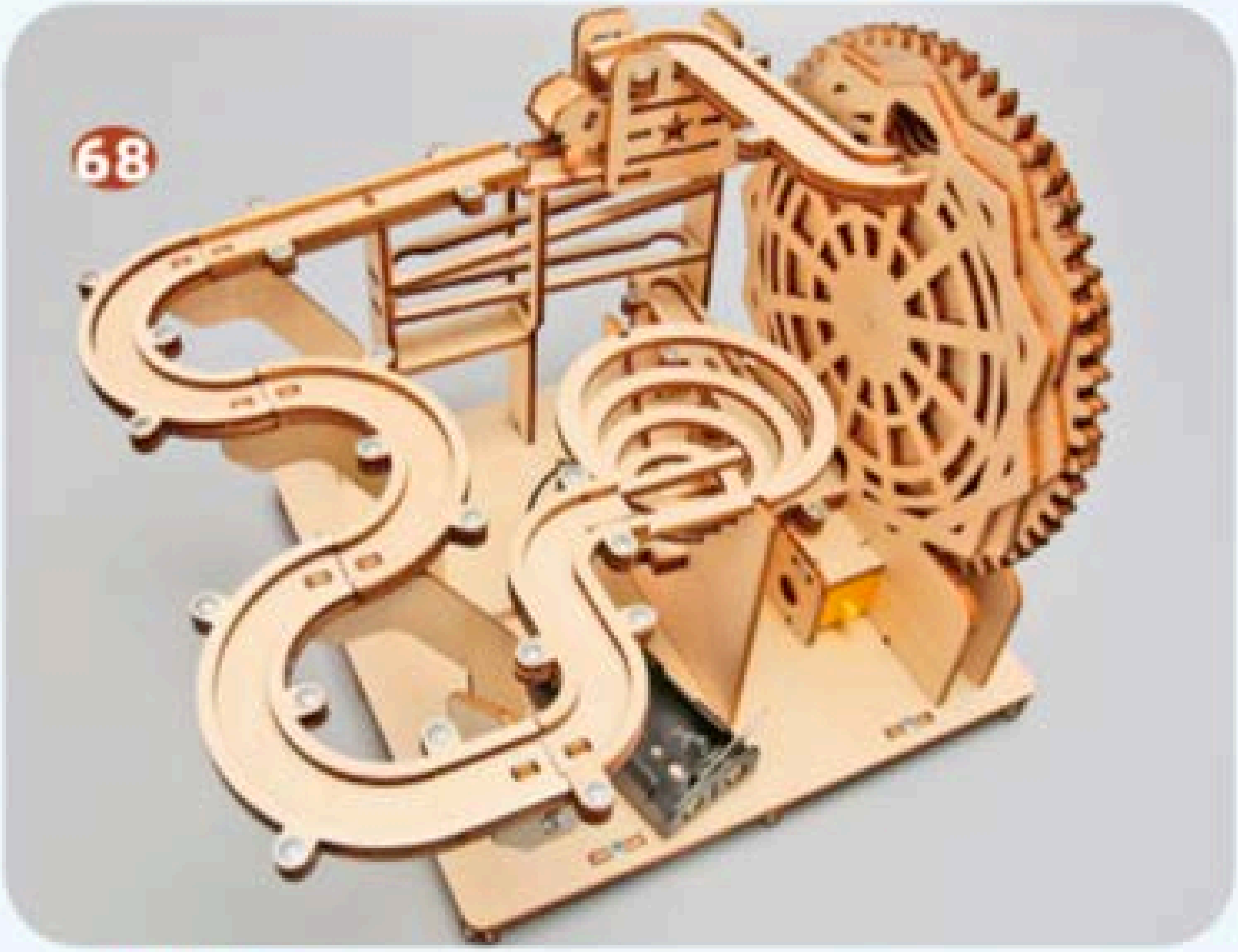
如图装好，准备下步零件及1颗6mm螺丝

Assemble as shown in the picture, and prepare the next parts and one 6 mm screw.



如图装好

Assemble as shown in the picture.



Push the spiral track into the slot as shown, then attach the other end.

Finished product display.

Scientific Knowledge

In daily life, the electrical energy we use mainly comes from the conversion of other forms of energy, including:

- Hydraulic energy (hydropower)
- Internal energy
- Wind energy
- Chemical energy (batteries)
- Light energy

Electrical energy can also be converted into other forms of energy as needed