

See drawings 'steptable1' to 'steptable5' and photos B01 to B17. Photos are from different attempts, so details may seem to vary. For esthetic reasons, dimensions of a few parts should be matched to the actual thickness of the plywood as indicated in the drawings. Have the wooden parts, the 55 mm steel pins, and the M6 screws ready before you start assembling.

- 1) Glue the 12 cm square plates centrally onto the 15+ cm square plates. Glue four side-walls, of which one (the front piece) has a larger gap, onto each compound plate. This gives two interlocking shells combining to a square box. You can make right-handed or left-handed shells but both must be the same. B01-B02
- 2) Select one of the shells to become the bottom. Attach the three feet; one of them must be below the larger opening that defines the front.
- 3) Glue the hinges into the slots of the parallelogram sidepieces. They should stick out 15 mm. B03
- 4) For the next steps, the two shells must be fixed together in their final position, with the two front pieces paired. Arrange the clamping plates and the templates as in B05 and B06, with the templates centered. You temporarily need four flat-head, 6 mm machine screws, 50 mm long (or similar). Tighten them without applying force. See drawings and photos B03 to B06.
- 5) Glue the eight spacer plates onto the sidewalls, flush with the templates. B06
- 6) Hold the parallelogram sidepieces firmly against the templates so that the hinges fit into the slots and the four 1.5 mm holes are over the spacers. Extend the holes into the spacers and sidewalls. Holes in the sidepieces should later be widened to accept the 2 mm screws. Number the sidewalls and the sidepieces so as not to interchange them later. B07
- 7) After doing this on all four sides, remove one of the four templates, put the clamp back on again and screw the two sidepieces to the sidewall. Then complete the parallelograms by gluing the slotted round rods to the hinges with fast epoxy glue. Keep rods and glue clear from the sidewall. See that the free part of each hinge has the same length. When cured, remove the parallelogram, remove excess glue with a sharp knife, put the template back on, and proceed to the next sidewall. Finally remove the clamps. B08-B09
- 8) Glue the inner walls into the bottom shell. Walls must point to the opening in the front side. The distance between the inner walls (30 to 40 mm) should be chosen according to the width of the aluminum levers; there must remain a few millimeters of space on each side, and the short pins must have room between the walls. Make sure that the 4 mm holes in the inner walls are aligned; put the long pins in before you glue. B10
- 9) Now the lever mechanism (B11-B15) is assembled and mounted between the inner walls. Hold the levers clear of the walls with suitable spacers (M5 nuts will do). Secure the pins by whatever means is convenient. Suitable rings or clamps used to be part of metal construction kits; you might also use small pieces of airplane plywood with precisely drilled 4 mm holes sitting tight on the pin. Apply a small amount of oil or grease where aluminum rubs on steel.
- 10) Glue and/or screw a flat piece of aluminum with a wooden spacer of suitable thickness to the center of the inner surface of the top shell, as an abutment for the ball bearing. Select spacer thickness so that the lower lever is nearly horizontal when the two shells are held together with the left and right templates between them (as when the parallelograms were mounted). This will later be the neutral position of the hinges. B16
- 11) Reassemble the table with the parallelograms. The step amplitude may be adjusted by narrowing the mechanical range of the wooden handle of the lever. Due to the stiffness of the hinges, the table may need a minimum load of 100 to 200 g to safely rest on its lower stop. B17 shows the finished table.

Plywood Step Table 15 x 15 cm

Material: (5+d) mm plywood, model-airplane quality

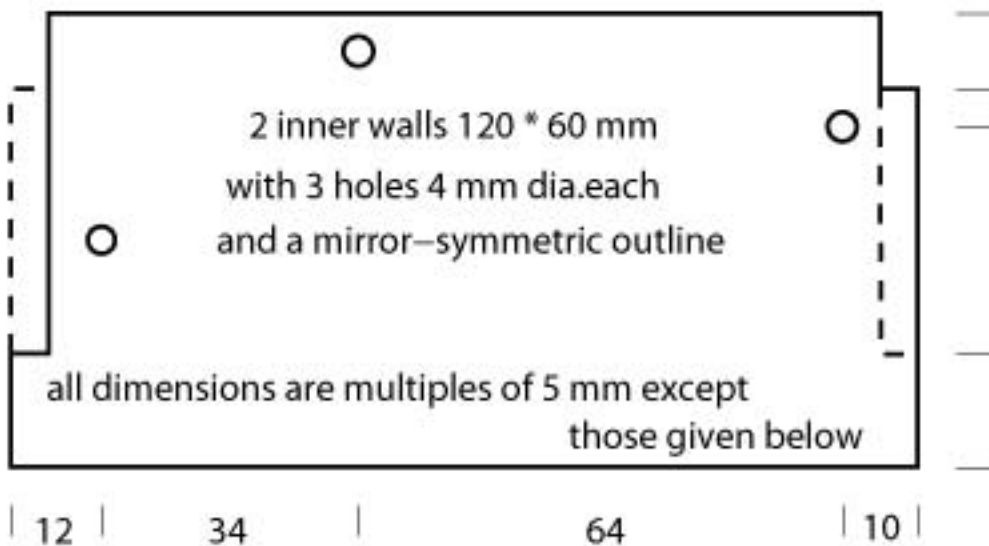
2 squares $(150+4d) * (150+4d)$ mm

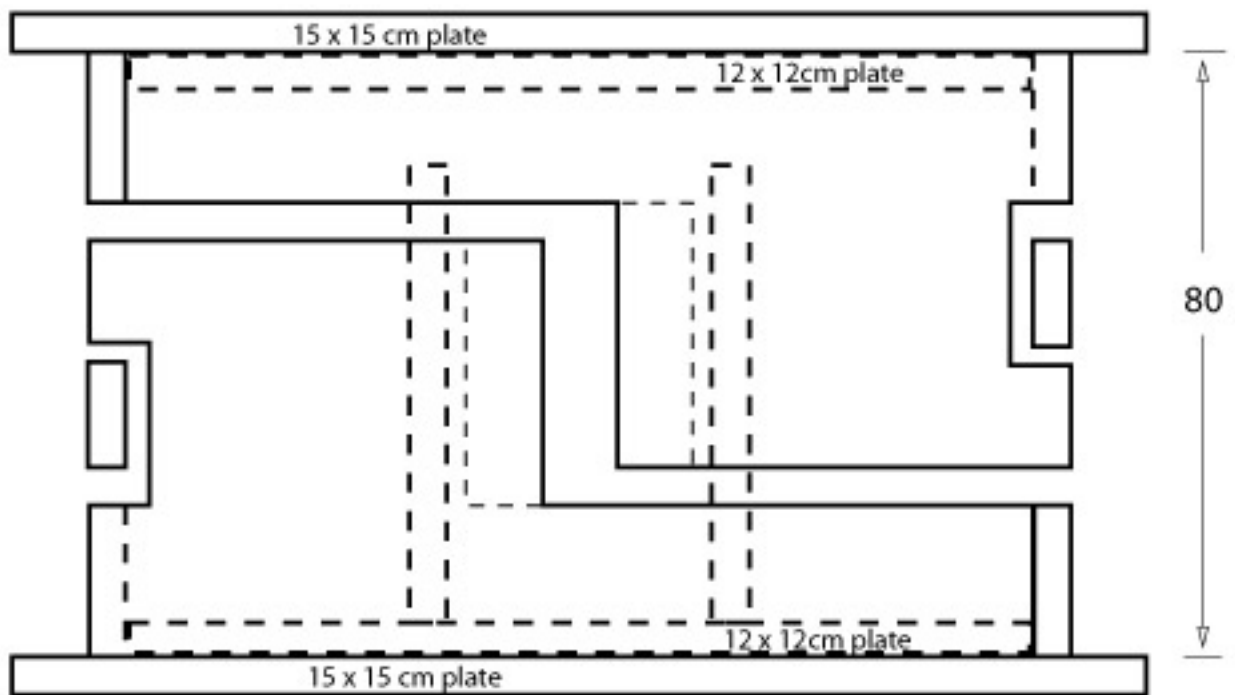
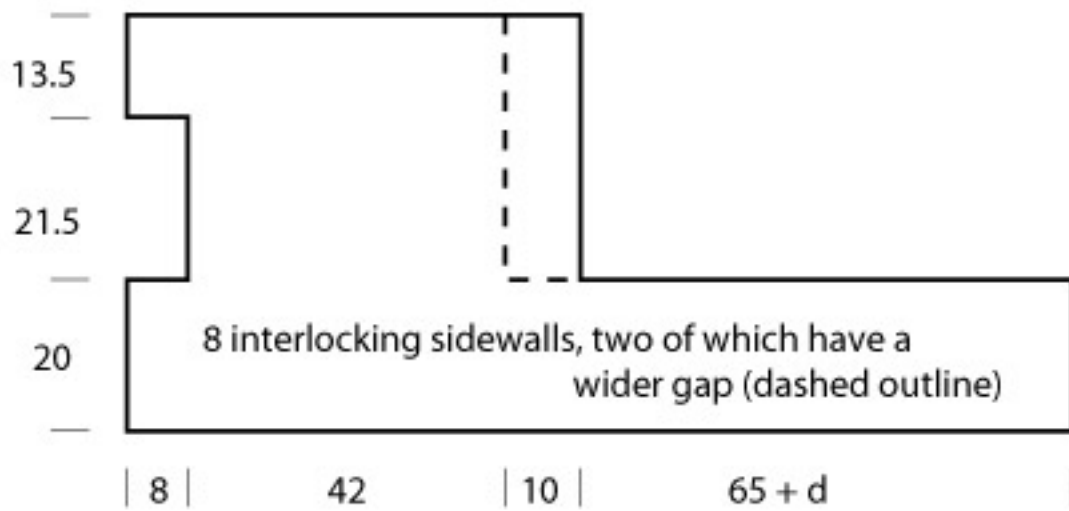
d = actual minus nominal thickness, may be 0.5 mm

2 squares 120*120 mm

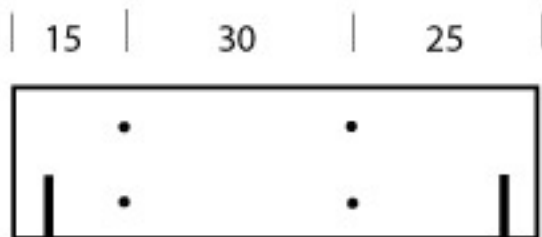
the smaller squares and the inner walls
must have exactly the same width

e

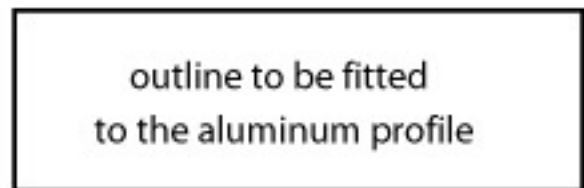




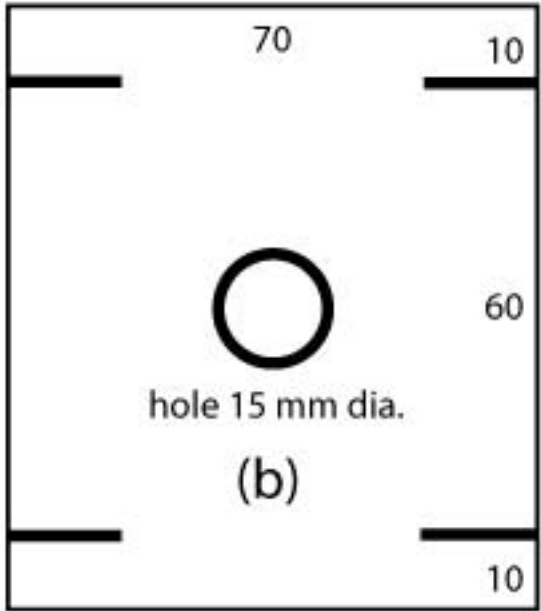
how the parts fit together – same view from all sides except for the inner walls and a wider gap at the front side



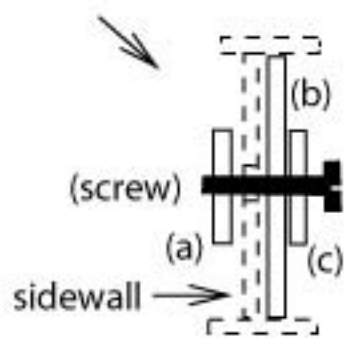
8 parallelogram sidepieces with 1.5 mm holes and cuts for the flexible hinges



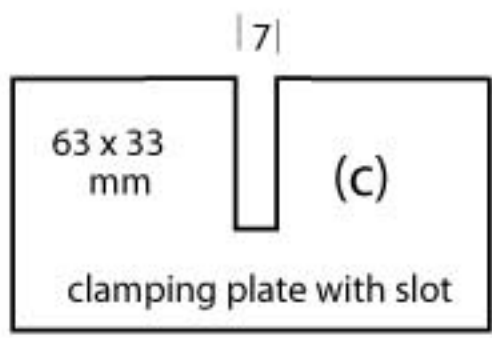
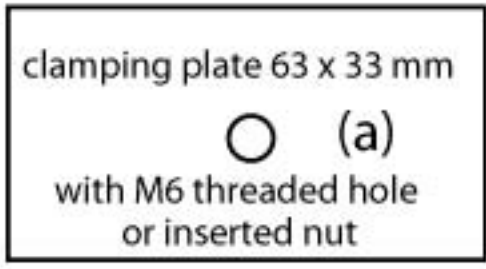
1 piece 70 * 24 mm max. (part of the reduction lever)



4 templates defining the position of the parallelograms. Clamp to the sidewalls as shown.

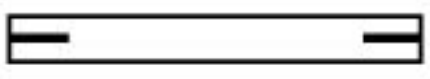


slots for the hinges



4 each. dimensions are uncritical, odd cuts will do.

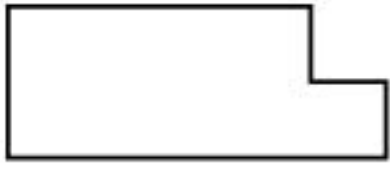
Parts made from other stock of wood:



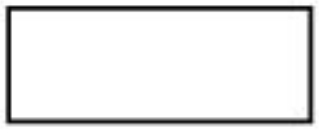
8 round rods, 6 mm dia., 55 mm long, beech
0.8 mm slots for the hinges, 8 mm deep



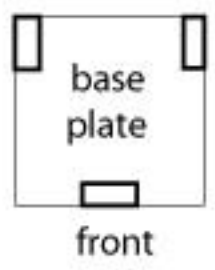
16 flexible hinges, 0.8 mm model-airplane plywood (mapw)
beech, 23 mm long, 6 mm wide



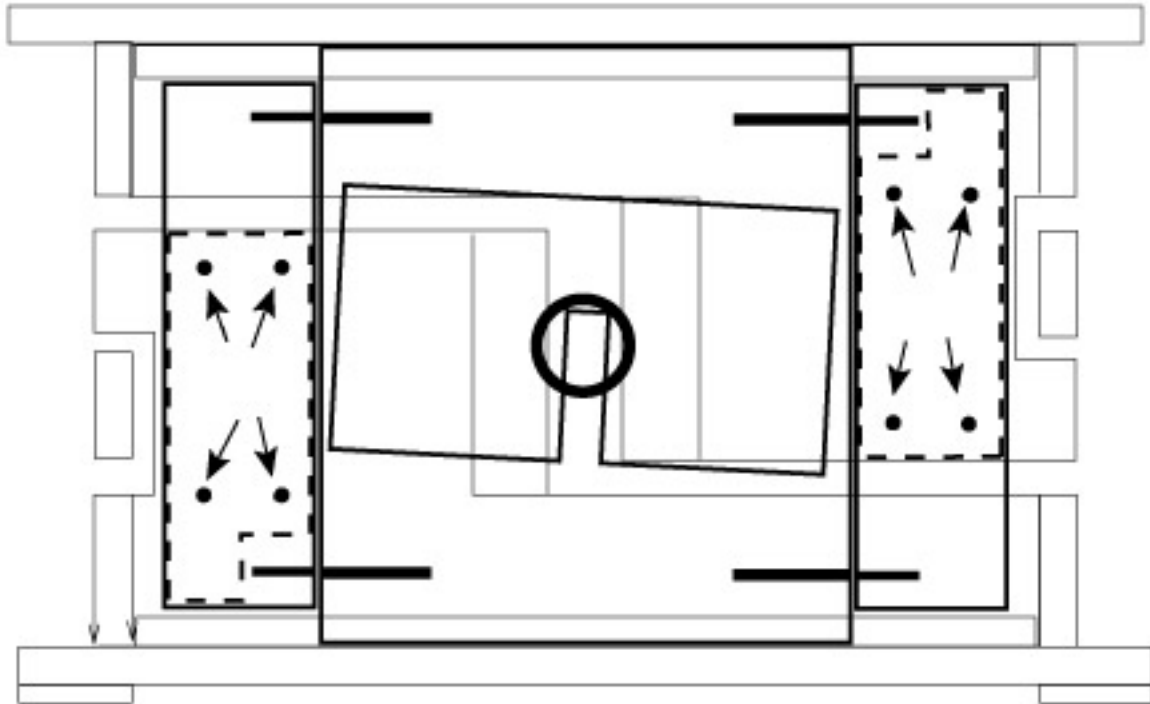
8 spacers 50 x 20 x 2.5 (or 3) mm, mapw



3 feet 40 x 15 x 2.5 (or 3) mm, mapw
mount like this



Drilling holes for the parallelograms into the spacers and sidewalls.
The pre-drilled sidepieces of the parallelograms serve as templates.



Aluminum and Steel parts:



Aluminum profile, roughly 20 * 10 mm (uncritical),
anything from 14*8 to 30*15 will do, even curtain rails
one piece 52 mm long, one 100 mm long



two flat pieces, 10 to 15 mm wide, 37 mm long

3 stainless-steel pins, 4 mm dia., 55 mm long

3 stainless-steel pins, 4 mm dia., length =



width of the aluminum profile + 10 mm

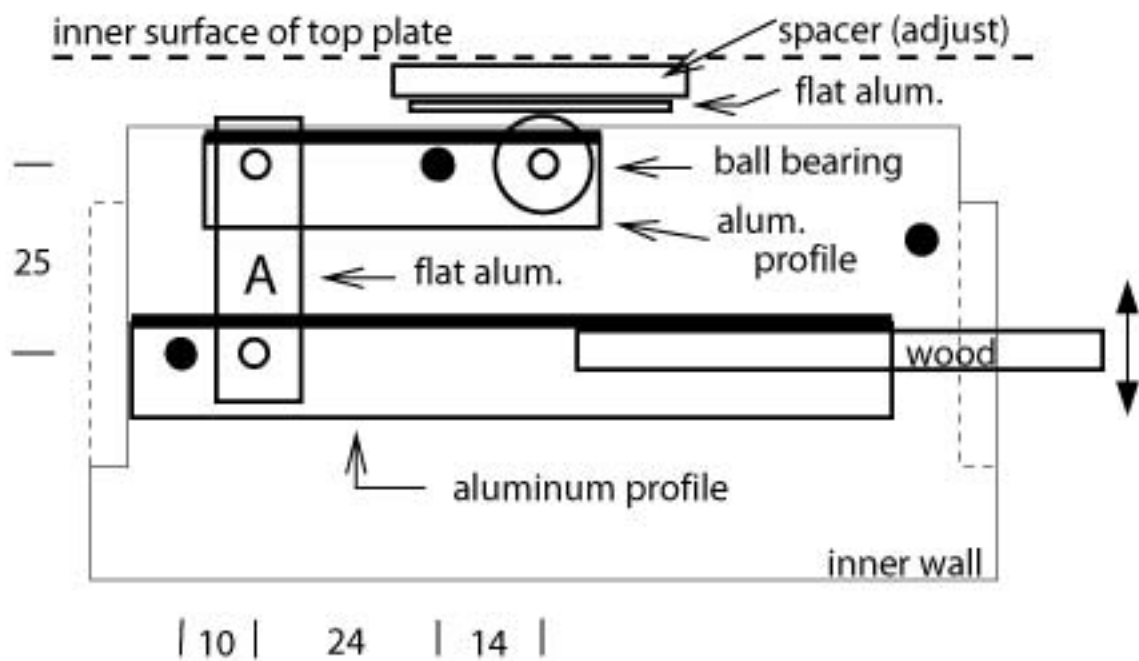


a ball bearing with 4 mm inner dia. (approx. 13 mm outer dia.)

38 small screws 2 * 12 mm (an electric screwdriver is helpful)

temporarily: 4 machine screws M6, 50 mm long, flat head

Reduction gear (modify according to available material)



- long pin (55 mm) through the holes in the inner walls
- short pin through the aluminum profile

cut out the aluminum profiles to accommodate part "A" and the ball bearing

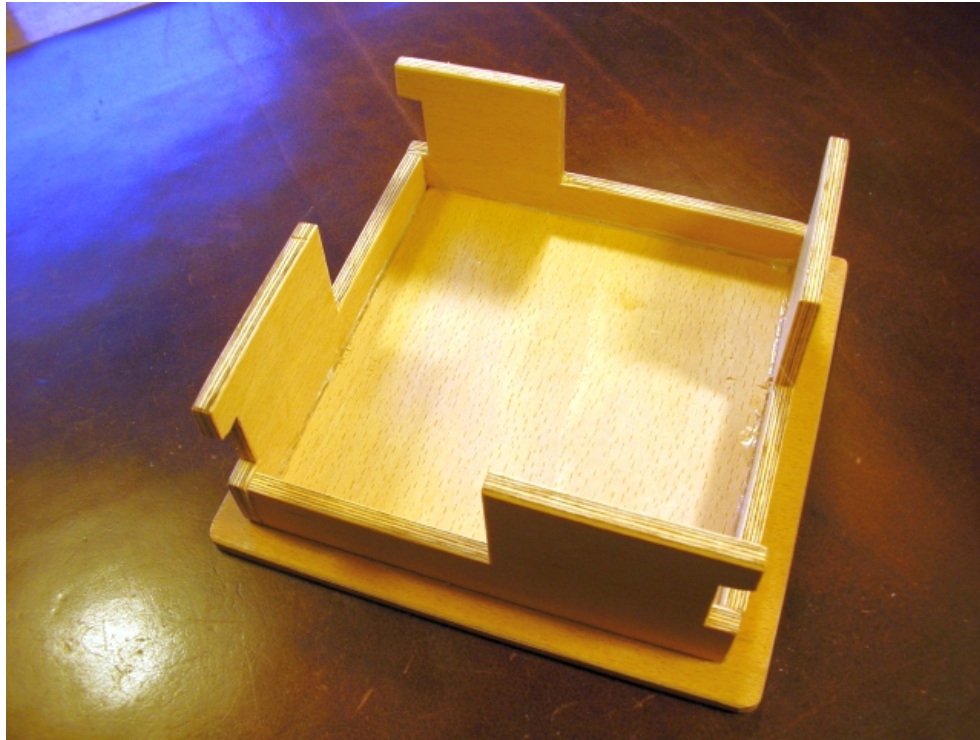


Photo B1



Photo B2

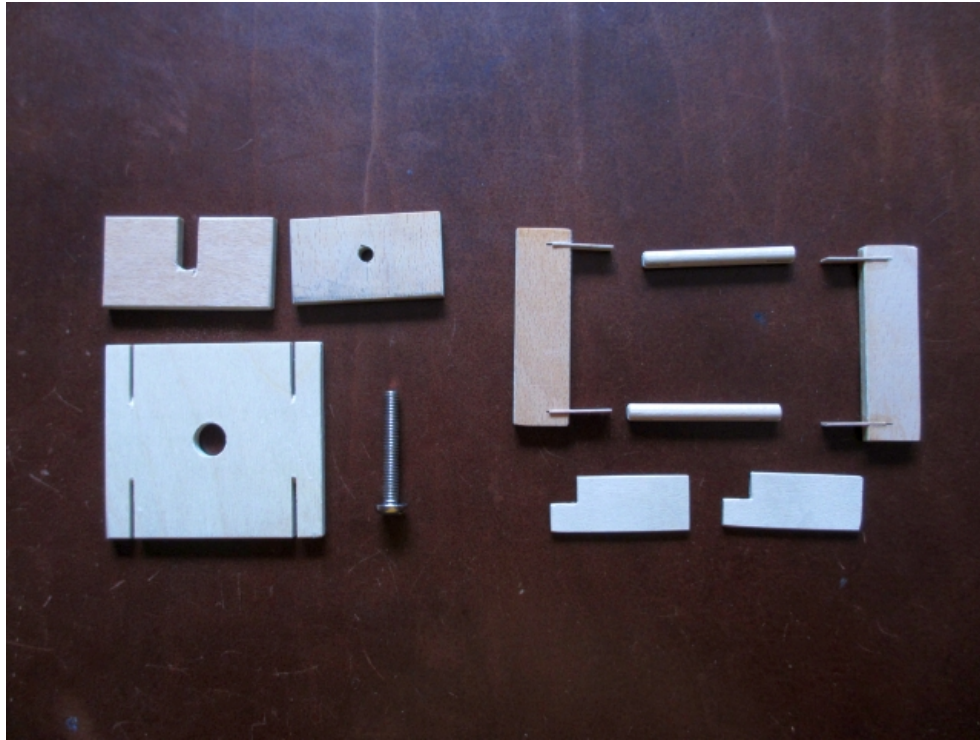


Photo B3

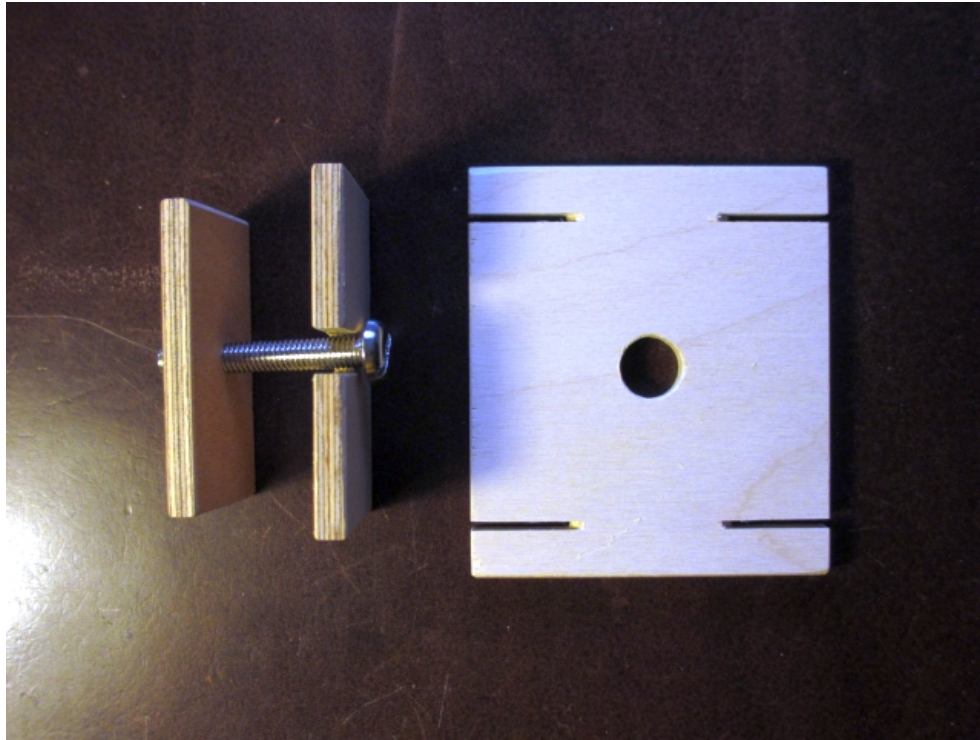


Photo B4

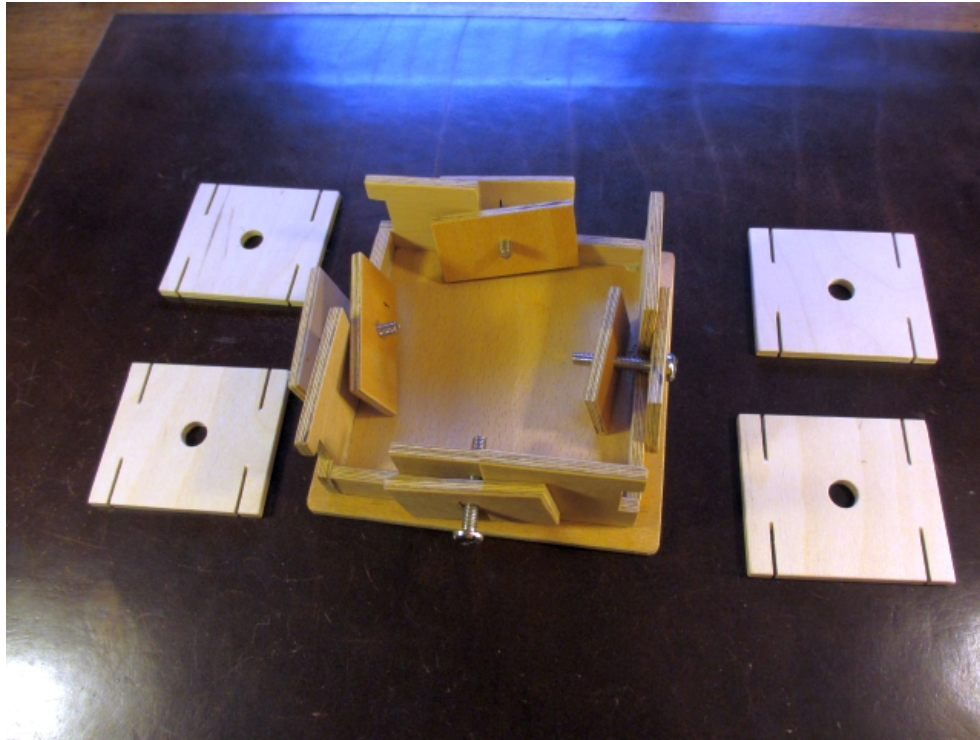


Photo B5

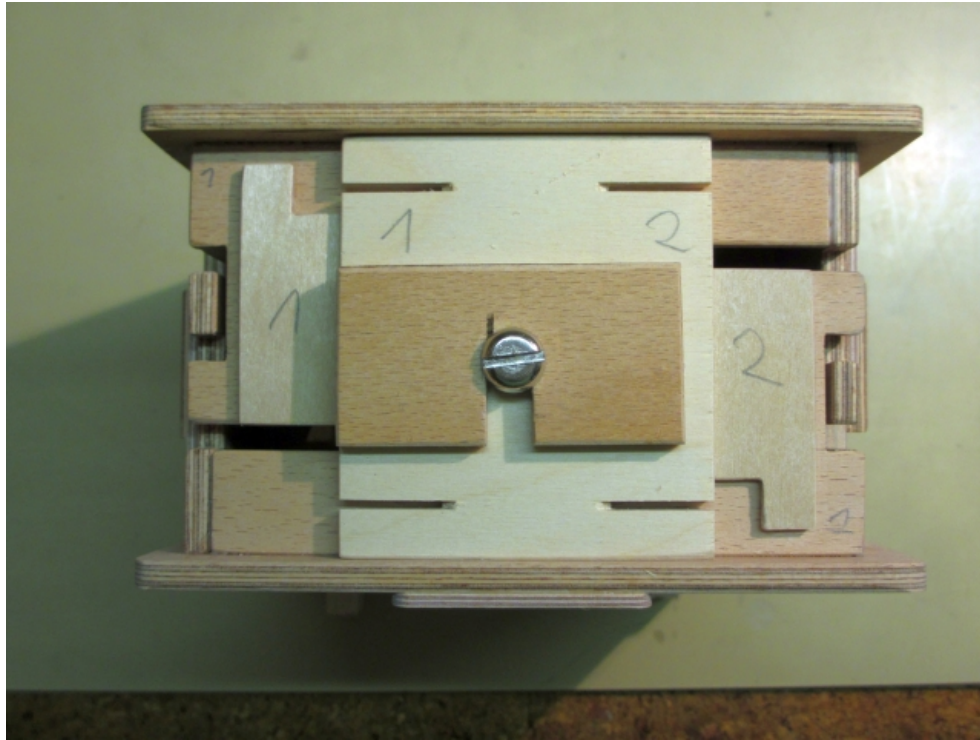


Photo B6



Photo B7

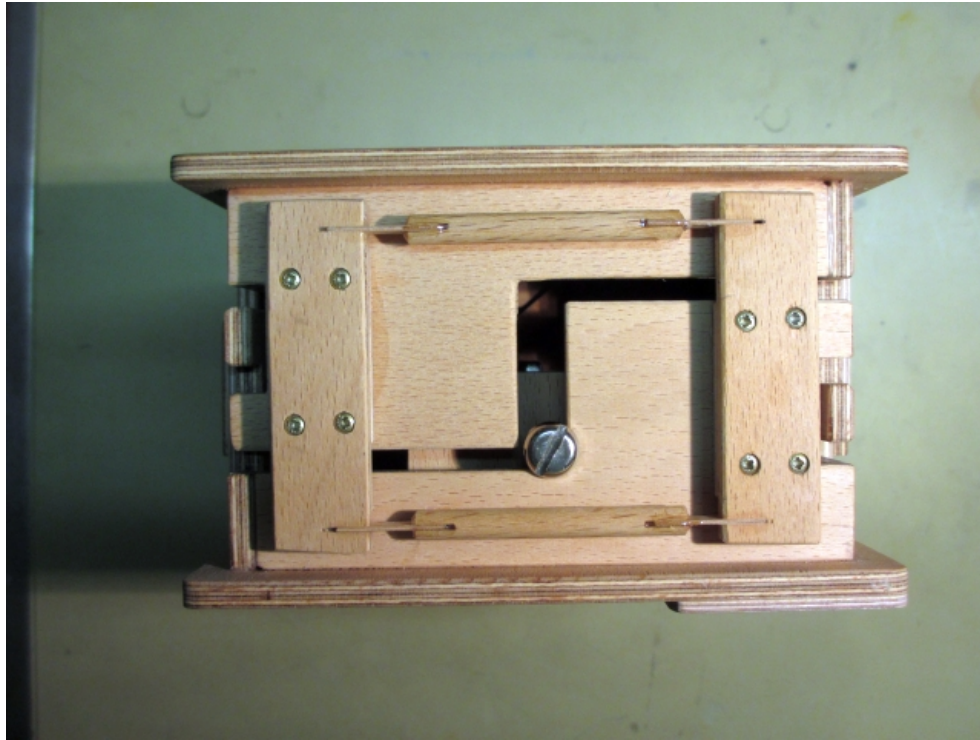


Photo B8

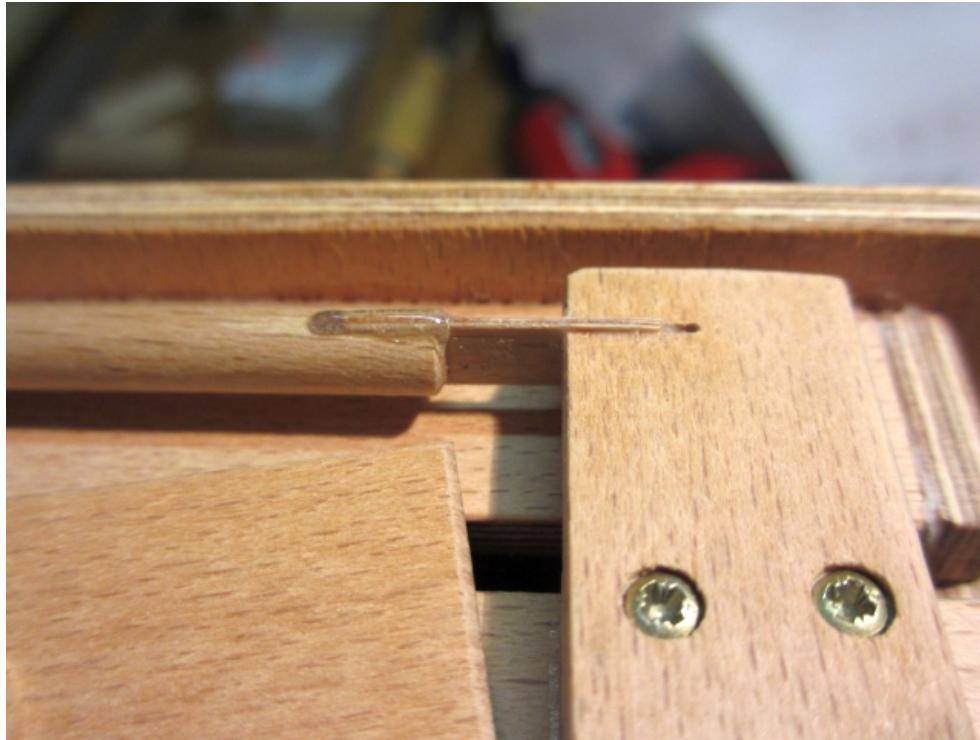


Photo B9

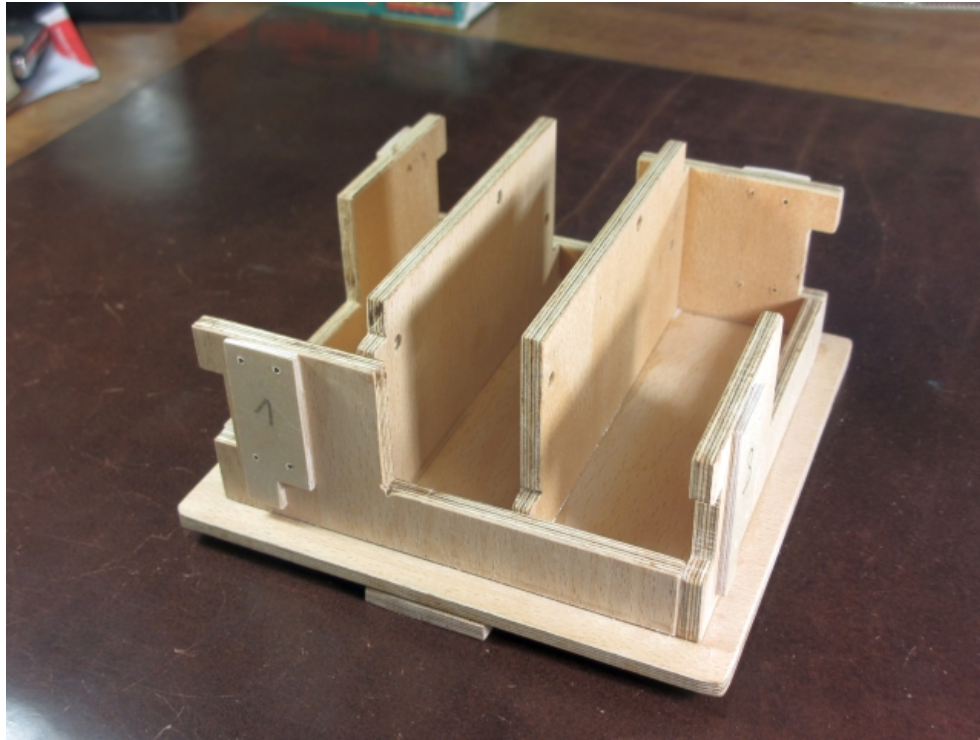


Photo B10

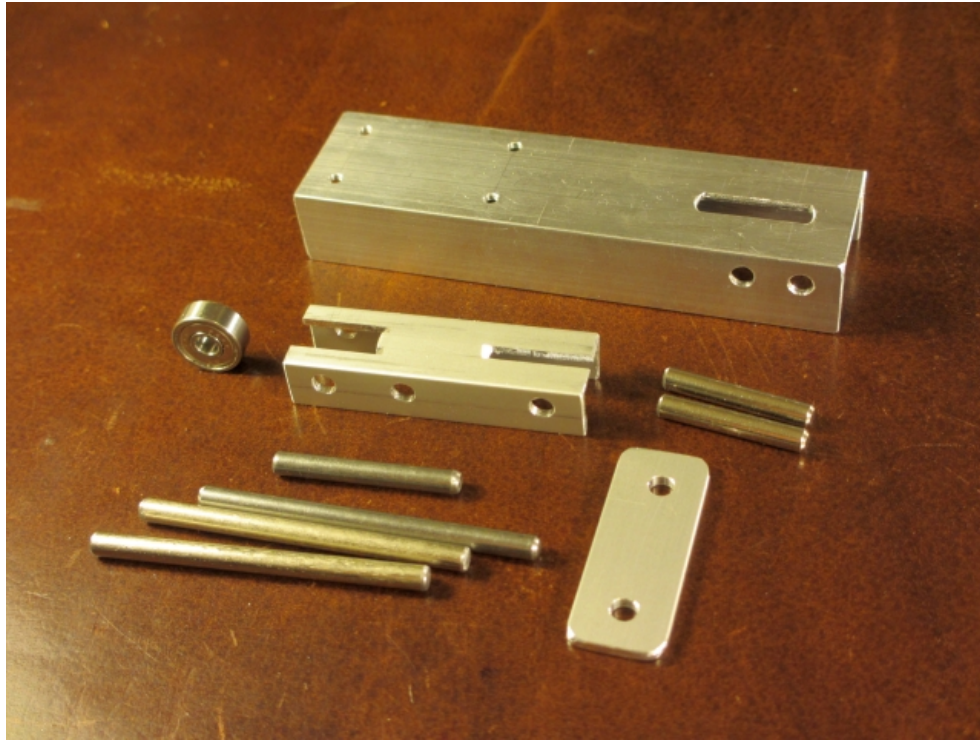


Photo B11

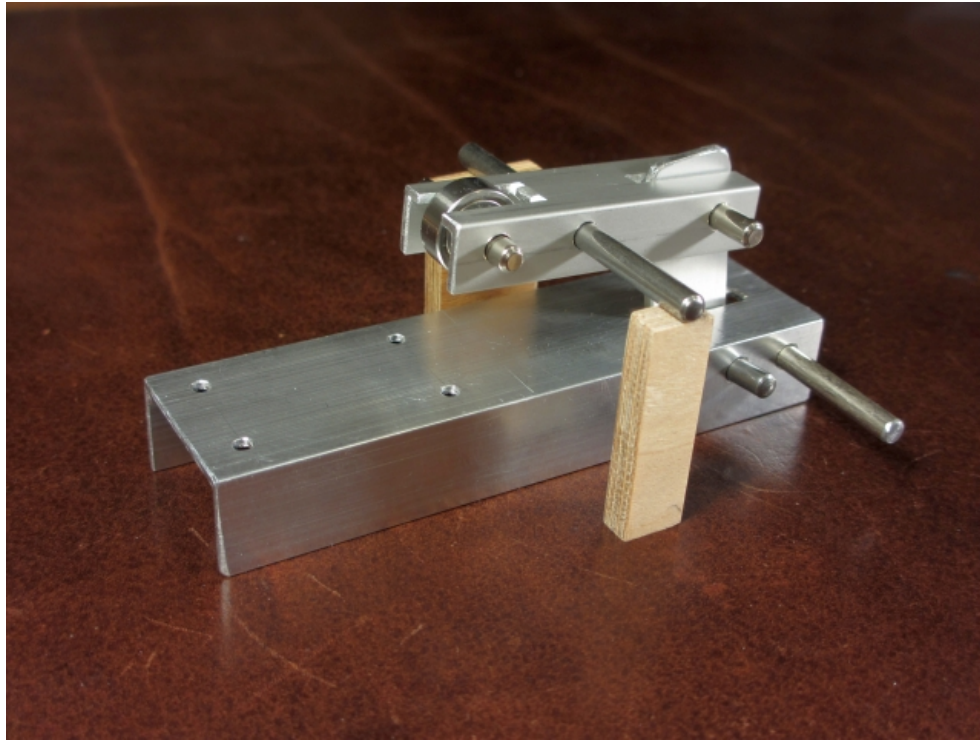


Photo B12

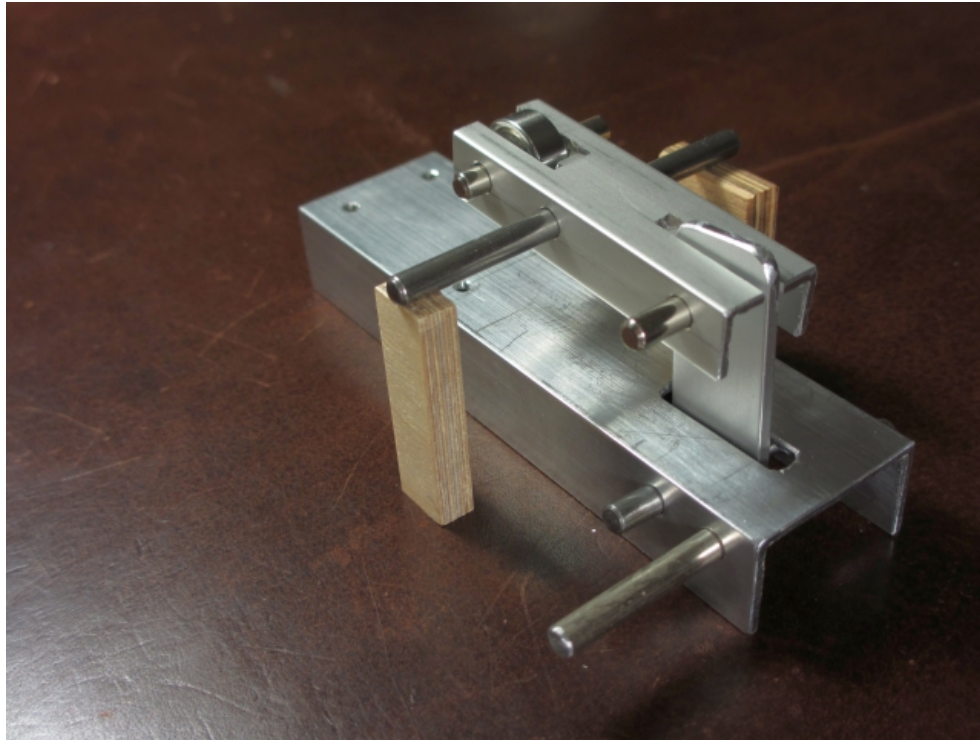


Photo B13

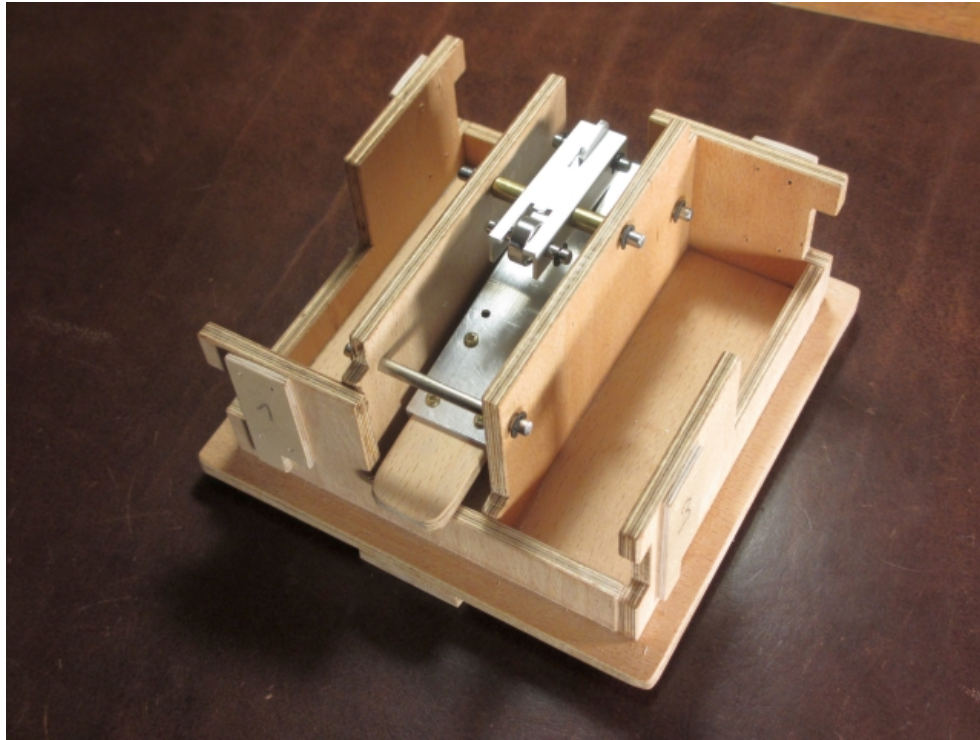


Photo B14

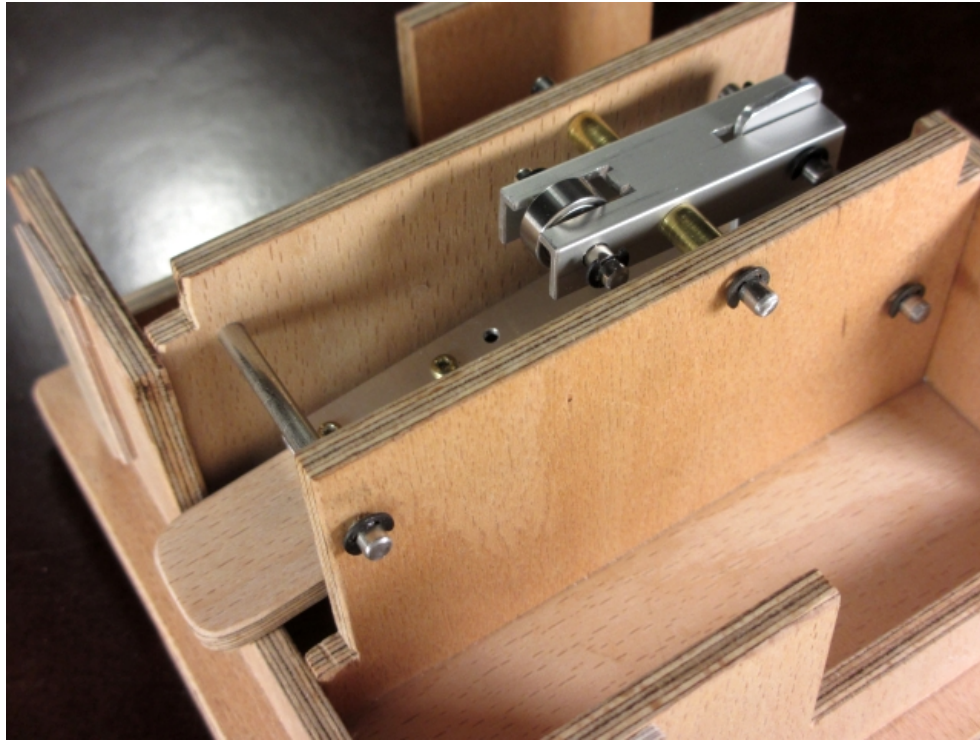


Photo B15

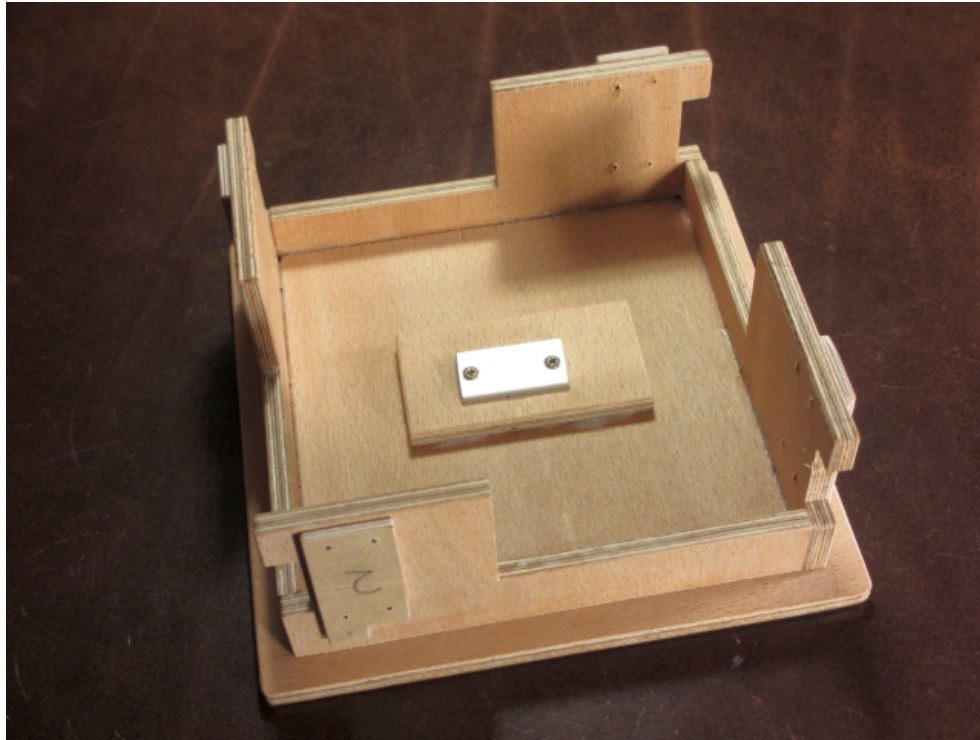


Photo B16



Photo B17