Maslow linkage kit assembly instructions

Your kit consists of 18 laser-cut wooden parts to make up the 6 linkage bars (bar A through F). Each bar is made up of 3 layers. The layers for each bar are labeled 1, 2, and 3 to denote the order that they should be stacked in. You will also find a small bag of hardware and a small bag of wooden parts.

Fig. 1 - These are the 18 parts for the linkage bars

Fig. 2 - A finished linkage with the included hardware, ready to mount

Sled preparation

Before you begin assembling your linkage you should mark your sled using B1 as a compass to ensure you have accurate measurements. Simply divide your sled evenly into 4ths (two lines that cross at 90˚), then with the center hole of B1 at the exact center of the sled mark where the outer holes cross your dividing lines (fig. 3). You will have 4 marks. If you have a sled that already has a large center hole for a router then mount your router to your sled and chuck a ¼" drill bit (or any ¼" stock) into the router. Extend the drill bit through the sled so it protrudes out the back. Slide the center hole of B1 onto the drill bit and mark your 4 spots as above. Next drill a hole at each mark using a no. 9 or 3/16" drill bit.

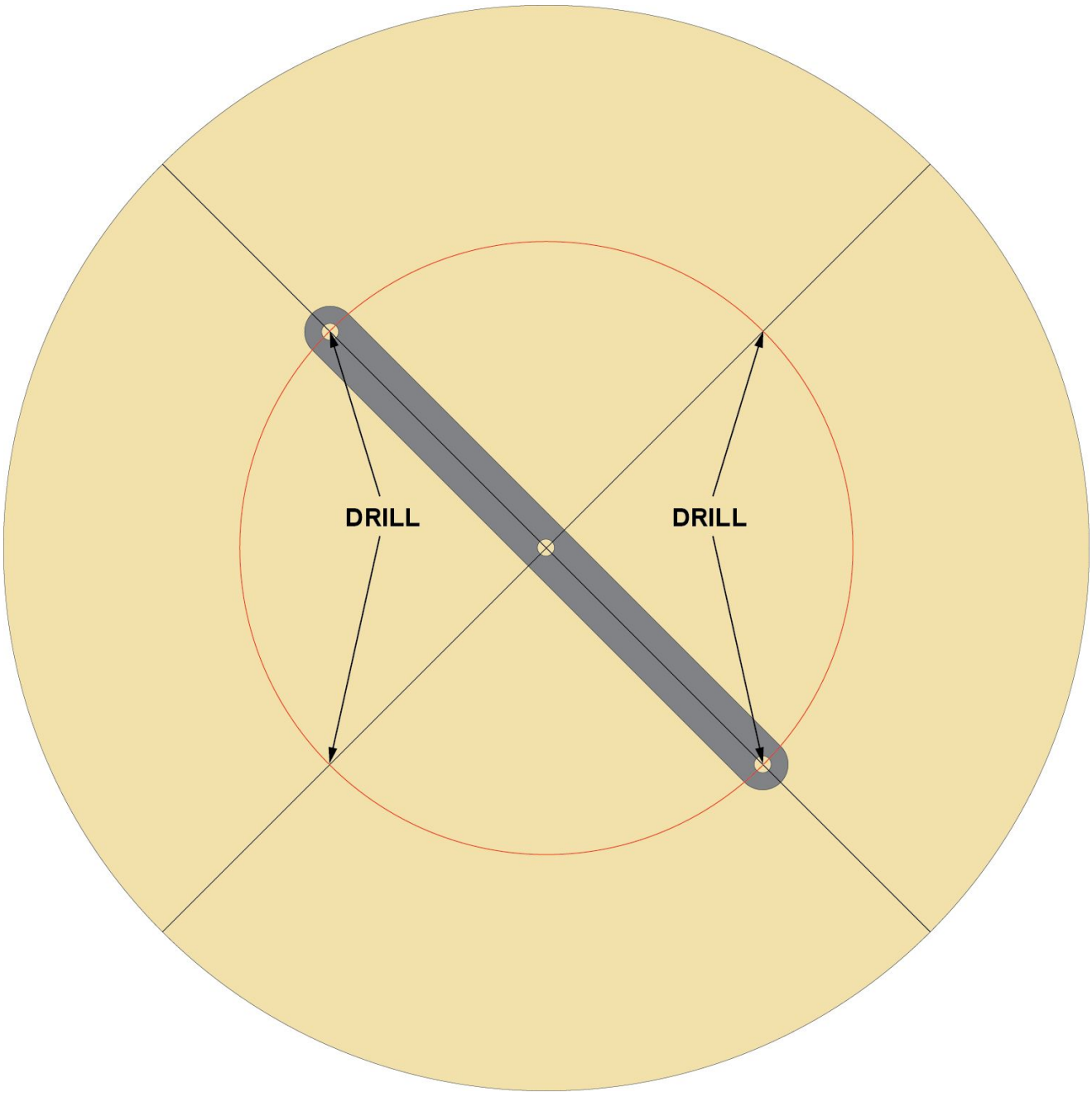

Fig. 3 - Mark and drill 4 holes for mounting the linkage

Linkage Assembly

Begin by sorting the wooden parts into stacks based on their letter (3 A's, 3 B's, etc.) Note: bars C and D also use the small round wooden "washers" that are in the small parts bag. You can ignore all G parts for the moment. Refer to fig. 2 if this gets confusing.

Once they are sorted you can start gluing things together, it doesn't matter if you go 1-2-3 or 3-2-1 as long as 2 is always in the middle. If you don't want any of the labels to show in the final product you can face the labels toward layer 2. The etched labels of all three layers should always be on the same end. For instance E1 and E2 are actually identical parts but they are assembled with their labels at the same end (fig. 1)

Sets A and F have a center hole marked "DOWEL". When you glue these layers together insert one of the provided dowel pins to help align the layers accurately (fig. 5). Make sure all three layers are lined up and gently clamp them until they are dry. Be careful not to apply glue too close to any of the holes (fig. 4) (it's okay for glue to get in the dowel hole, but that's the only one). If some glue squeezes into a hole simply wipe it out with a damp Q-tip before it dries.

Fig. 4 - The hole marked DOWEL can receive glue but keep glue away from all other holes!

Fig. 5 - Glue a dowel pin into the holes in bar A and bar F. Dowel pins can be trimmed or sanded after the glue dries.

Note, all parts can be sanded before glue-up and the assemblies can be sanded after. Sanding is optional but in some cases might improve use especially where wood surfaces will rub against each other.

Use one of the provided nylon bushings to help align the layers (fig. 6); make sure you don’t accidentally glue a bushing into the hole! Note: bushings may be black or white.

Fig. 6 - Use a nylon bushing to align layers. Periodically move the bushing while the glue dries to assure it doesn’t get glued in.

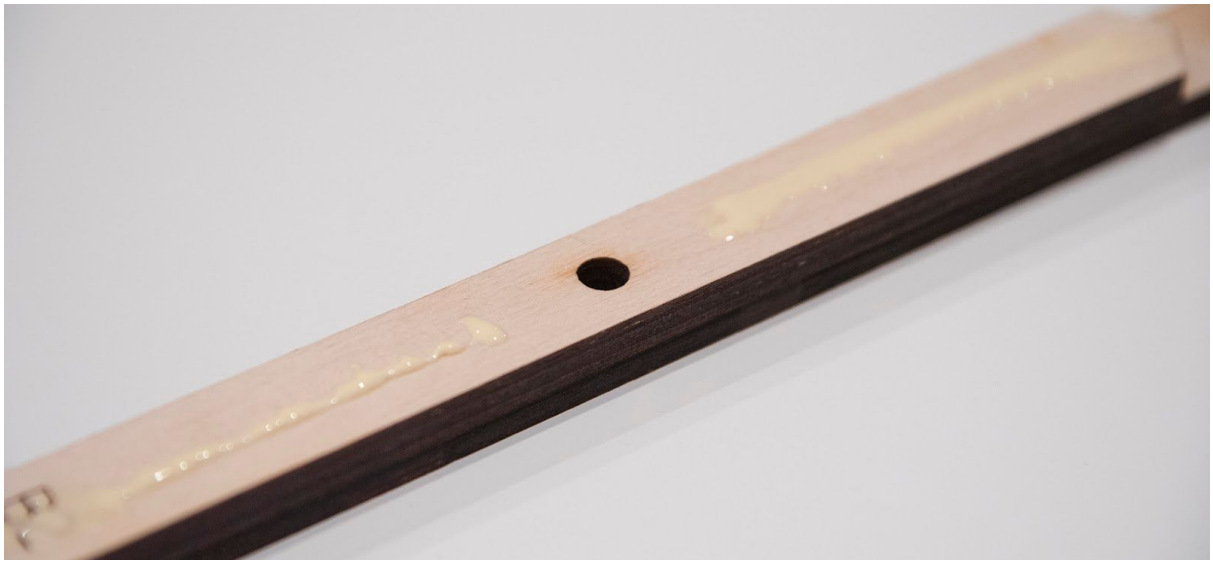

Fig. 7 - Keeping glue away from all holes except the dowel holes

Assemble all linkage sets in the same manner; use the long barrel bolts and the nylon bushings to align layers as you go. Bar A and bar F are identical.

Fig. 8 - Using barrel bolts to carefully align layers

Fig. 9 - Use care when gluing bar C and D, you don’t need a lot of glue

For bar D use another piece of wood to space things properly while you clamp it. In these pictures I used pieces from the E bar, but shorter G pieces work great for this. Again, make sure the holes are aligned using the barrel bolts and nylon bushings.

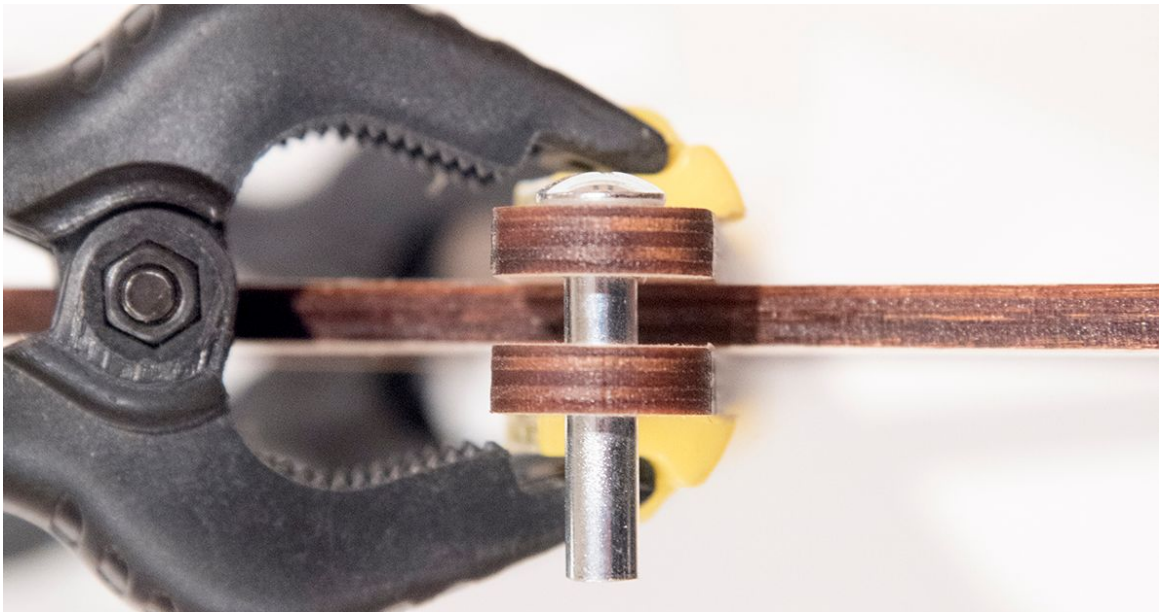

Fig. 10 - Check alignment from the ends as well

Fig. 11 - Bar D drying, using extra pieces as spacers

Fig. 12 - Bar F ready for final layer

Fig. 13 - Bar F final glue-up (keep those bushings free!)

Now that all 6 bars are finished we will make the chain clevis connection using the G parts.

Fig. 14 - The clevis uses the same assembly style 1-2-3, but layer 2 fits into layers 1 and 3

Glue, assemble and clamp the three G parts using a barrel bolt to keep things lined up (fig. 15). The “U” shaped holes in G1 and G3 are to allow easy access to the chain attachment point if things ever need to be changed or adjusted.

Fig. 15 - Gluing up a G clevis

To attach the chain to the clevis thread the chain through the rectangular hole and insert one of the included cotter pins into the the chain. Take care that the cotter pin rests perpendicular to the chain i.e. flat against the wood (fig. 17).

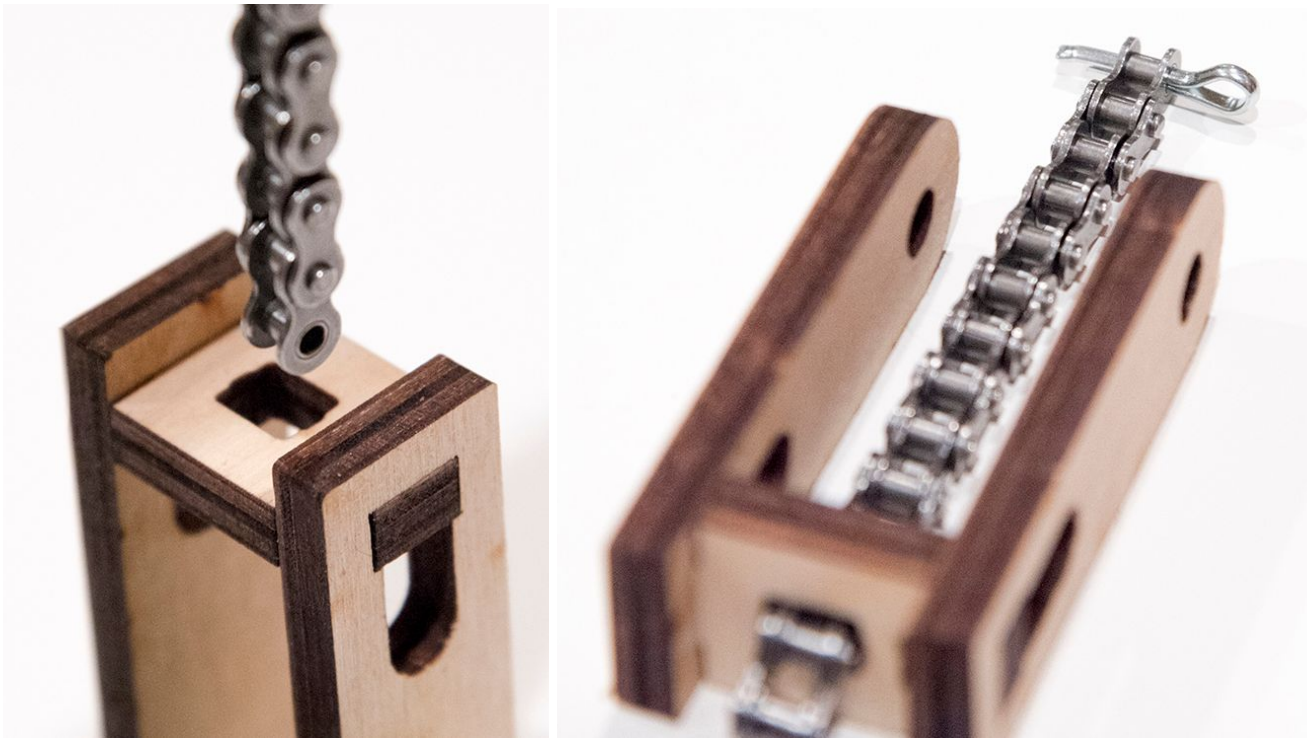

Fig. 16 - Insert chain into clevis, then insert cotter pin into chain

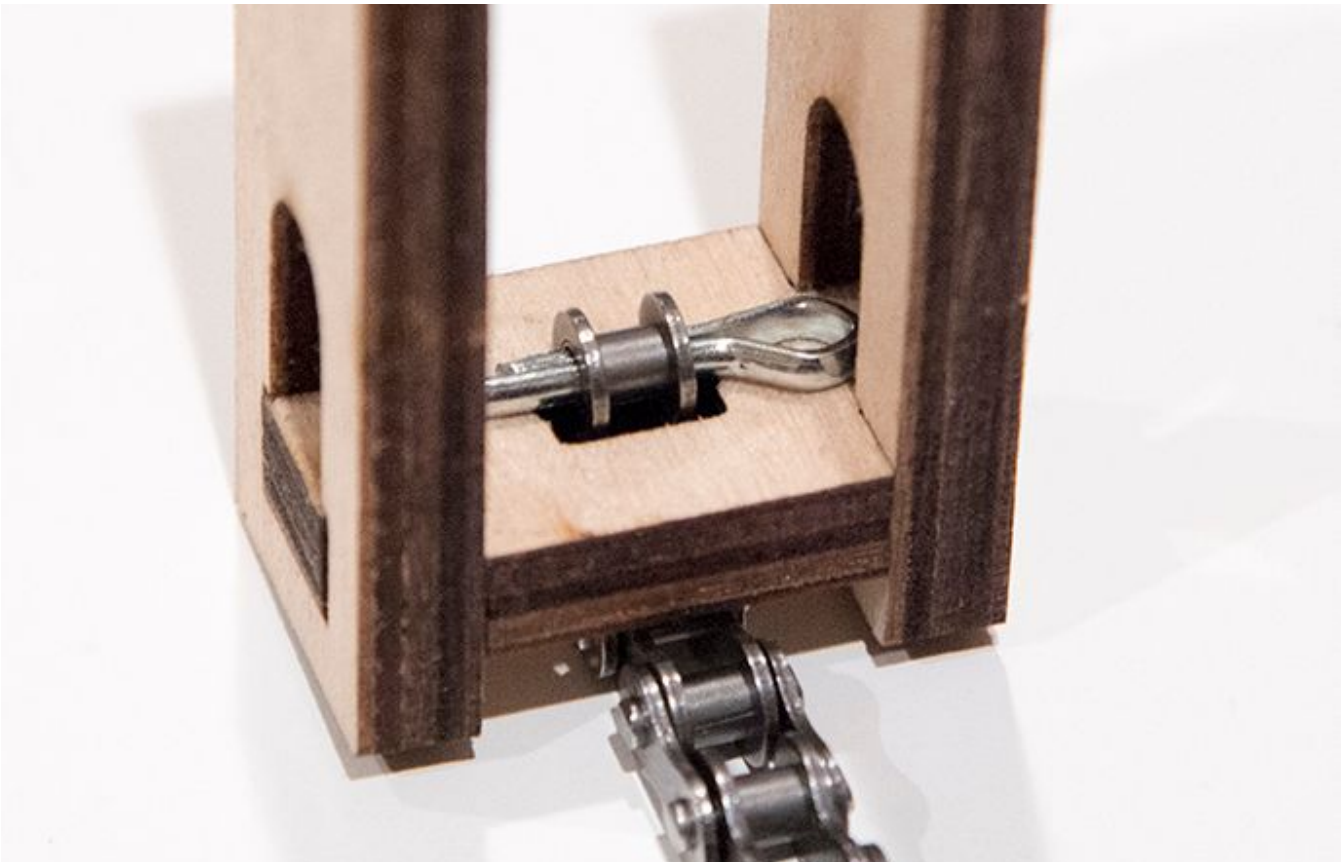

Fig. 17 - Cotter pin should lay flat against G2

To assemble the bars into a final linkage simply slip the joints together in the order shown in fig. 2 and insert a short female barrel bolt and a ¼" shoulder bolt. The barrel bolt can be tightened down snugly to keep it from coming apart. It will not pinch the joint.

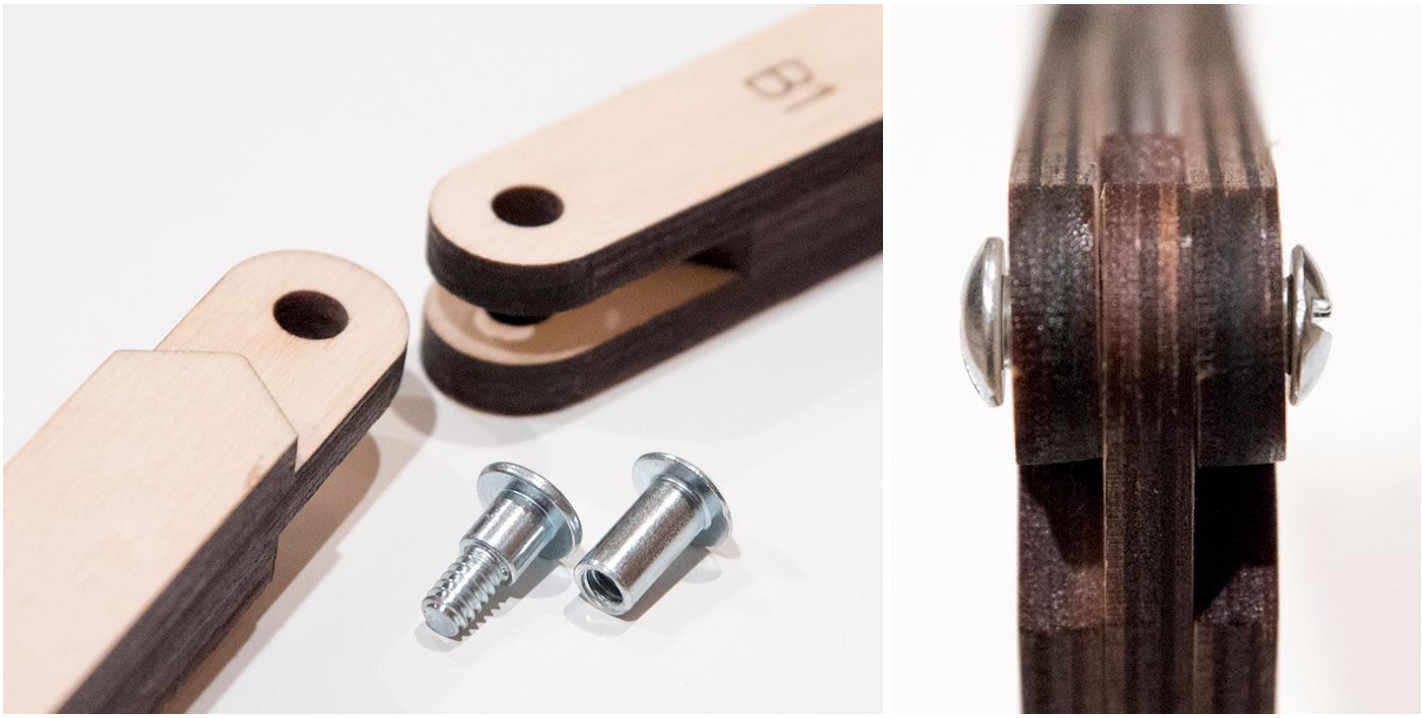

Fig. 18 - Short female barrel bolts are for the linkage joints, note the space between the heads of the bolt and the wood

Bar C and D must be assembled together so that C runs between the arms of D (fig. 19)

Fig. 19 - Bar D goes over bar C

The two clevises attach to bar B and bar E using the long barrel bolts and truss-head screws. These can be tightened down without binding the joint - there should be some space between the bolt heads and the wood.

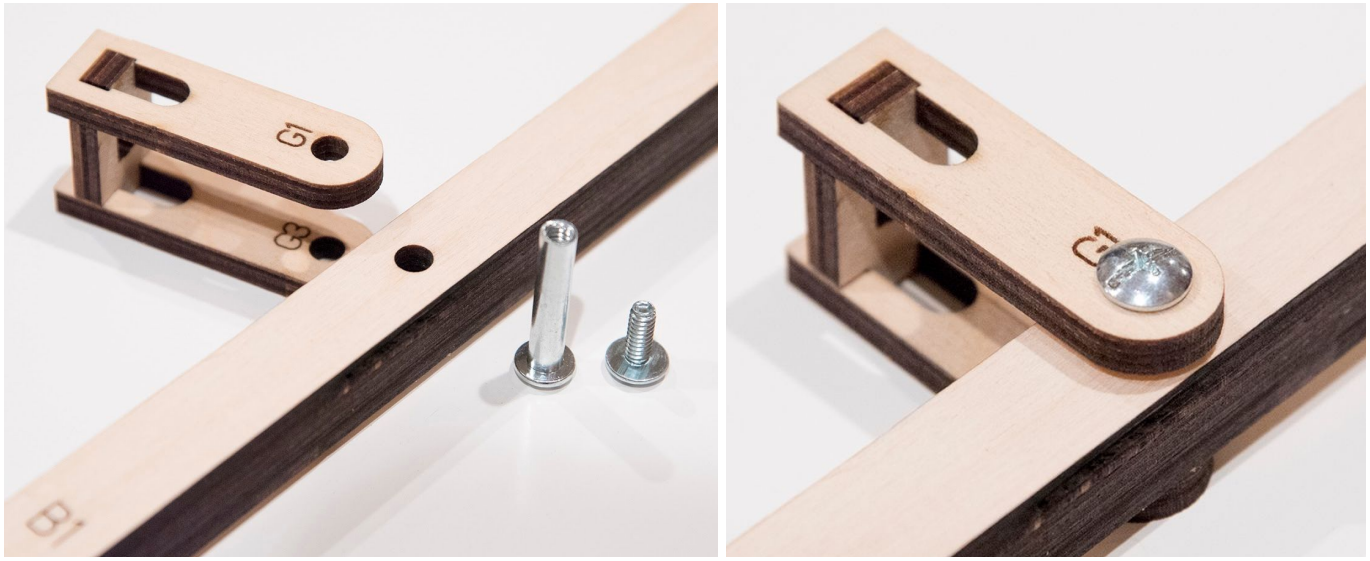

Fig. 20 - Clevis attachment using the long barrel bolts

The finished assembly should look something like fig. 21.

Fig. 21 - Finished assembly with all mounting hardware

To mount your linkage to your sled you need to determine how far off the sled it should be. If you were previously running a stock Maslow then you may have already determined a good spacing for your chains (the space between the work surface and the chain). A good rule of thumb is that the linkages should be mounted roughly near the sled's center of gravity in the z-axis. This measurement is not extremely critical but if it is off by too much it could cause the linkages to bind or rub in a manner that is not conducive to accurate cuts. Ultimately the goal is to have the chains running parallel to the work surface, so the distance of your motors from the work should match your linkages. Once you have determined a good spacing (let's use 2" as our example) then cut 4 blocks of wood 2" long. The blocks don't need to be very big but they should have sufficient surface area for glue; I suggest about 1 ½" square. Drill a 3/16" hole all the way through each block in the 2" direction. Counter sink the 3/16" holes in the sled from the back to accommodate the head of the #10 machine screws. Insert the provided 4" #10-24 machine screws from the back of the sled and through the spacer blocks. Add a washer (provided) to each #10 screw, then carefully attach the linkages with the nylon bushings sliding over the #10 screws. Add another washer to each screw then finish them off with a 10-24 nylock nut (provided). You should be able to tighten these down snugly and the linkages will still move freely. A small amount of friction is completely acceptable in this design. If things are binding then you need to find the friction points and fix it. Once you have tested your spacer blocks and are happy with the balance they should be glued securely to your sled. You can use it without gluing the blocks but things will be more structurally sound if they are glued.

Some of the linkage joints might require light reaming with a ¼" bit after they are glued, especially if some rogue glue seeped into a hole. The large holes can be reamed with a ⅜" drill bit if needed. I would suggest doing any reaming by hand (not with a drill) because it's easy to take off too much material but it's quite hard to put it back!

That's it!! You've built your very own Maslow Linkage! Give yourself a high five and go cut something awesome!

If you ever have any questions or problems you can message me through the Maslow forums (username pillageTHENburn). There is also a public forum topic related specifically to this design which can be found here. If you are interested in reading some of the development process of this linkage and much more you can find that in the "Throwing my hat in the sled modification ring" topic in the Maslow forums.