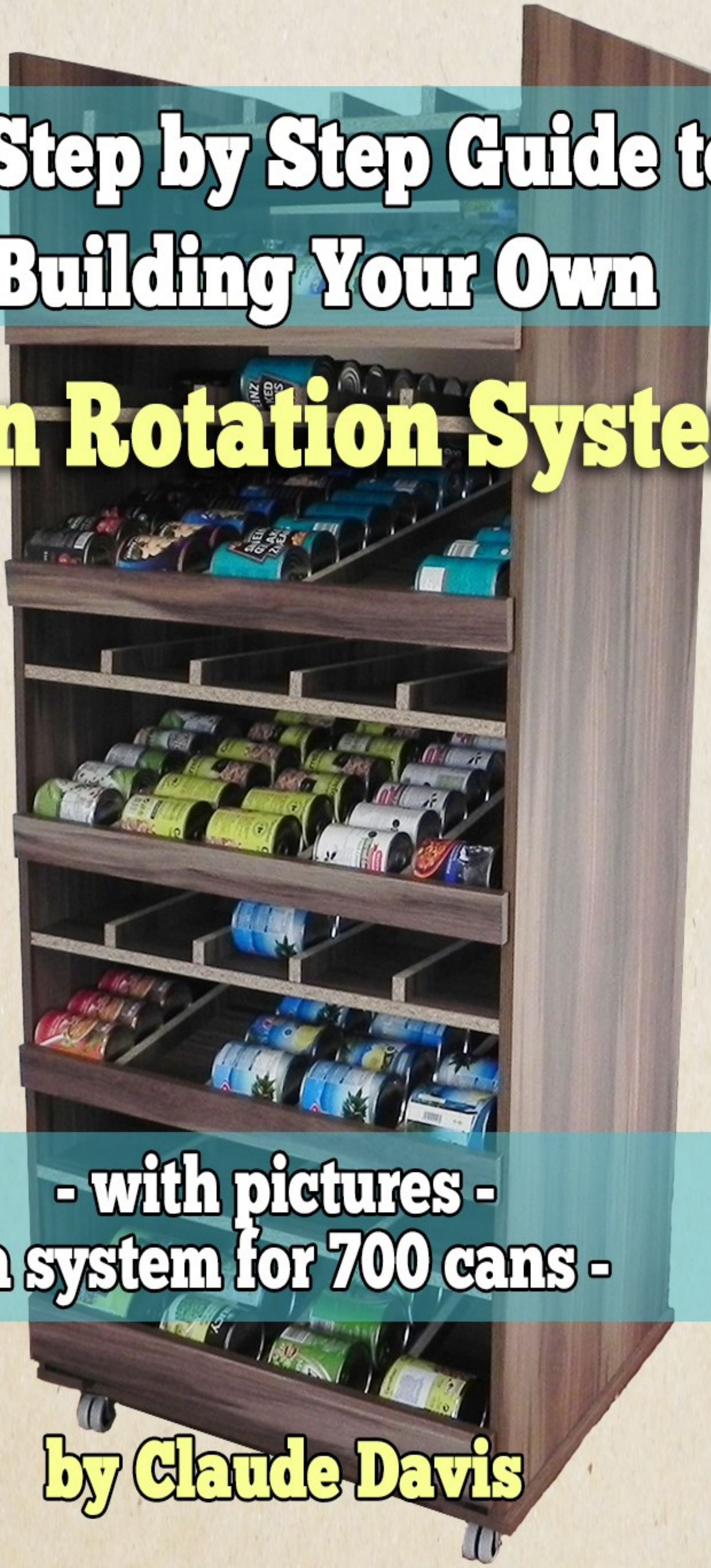
A Step by Step Guide to Building Your Own

Can Rotation System



- with pictures -
- a system for 700 cans -

by Claude Davis

The Only Disclaimer That You Might Actually Read

…because it's probably the shortest.

When you use woodworking tools, sharp object, drills, nails, screwdrivers, etc., accidents can happen. The author of this book takes no responsibility for what you are doing. The information in this book is purely informal.

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A Few Words About the Rotator System

Below, you can see how it will look. You can change its design by choosing other materials, like other particleboard models with another type of veneer—something that will make a good match with your home design. You can build it with other types of castors or without castors at all.



As you can see in the picture on the next page, the mechanism is very simple. Whenever you buy new cans, you insert them in the upper shelf. The can will automatically roll, and then it will be the last one in the row.

When you pick them up, you do so from the shelf below, so you will always pick the can that you bought first, therefore with the closest expiration date. (See picture)

You can feel some security knowing that you have some food reserves. Thus I have around 1,000 cans at almost all times. A few times, some of them passed their expiration date just because I overlooked them. It's a waste of time to search 1,000 expiration dates to see which one you should eat first.

For me, the can rotator was a money and time saver!

Plus, it looks a lot better than my old can shelves, and it's very organized.

Designing the Can Rotator System for YOUR Cans

Before building the can rotator, I thought about it a lot. Trust me on this one:

The only right place to start is with your cans!

The first thing you need to do is measure them. Unfortunately, there are no standard sizes for cans. (Actually, there are, but the manufacturers design them each in their own way.)

You also need to know approximately how many of each size you want to stockpile. If you don't have any cans, then you will need to go buy some that you'll definitely use and then measure them.

One of the things that I like is the baked beans in tomato sauce from Heinz. If you want to order these from Walmart, you can buy a pack of 12 for $35, making it a little bit pricy. Another problem with these cans is the expiration date (which is somewhere between half a year and one year). But it doesn't matter to me, because I love them! On top of that, these are pretty healthy. They are full of fiber and have NO preservatives or artificial colors at all! I eat four or five every month easily. And in two or three months, I resupply by buying another pack of 12. This way they never get spoiled.

These cans come in different sizes. You can find them in 14.1 oz. tins (415g), 13.7 oz. tins (390g), or 14.6 oz. tins.

The difference in cm or inches is so small that it might not even matter, but you still need to measure the cans.

For my tins, the measurements were:

L = 3 inches (7.5 cm)

and

H = 4 ¼ inches (10.8 cm)

Most likely these will also be your tins' dimensions but not necessarily—even if they are made by the same manufacturer.

After I measured all my cans, I found out that almost 45% of them have similar dimensions with the ones above.

About 25% were considerably smaller:

I have all sorts of smaller cans, from pâté to sweet corn. A good example is the Heinz sweet corn, but the dimensions are pretty much the same for all of the tins in this category. They weigh 14 oz. (400g) and are not very sweet.

L = 3 inches (7.5 cm)

and

H = 4 inches (10.2 cm)

About 20% were considerably larger:

The most common were my pineapple cans. I eat those on a regular basis, but I they are not very good as the main source of survival food because they have basically no fat, they are low in proteins, and they have only a decent amount carbohydrates. I store these for VITAMINS (a whopping 25% of Vitamin C) and MINERALS (especially iron) and because I like the taste. You can buy 20 oz. (567g) Dole pineapple cans in packs of 6 on Amazon.

For this kind of tin, the measurements were:

L = 3 $^{1}/_{3}$ inches (8.5 cm)

and

H = 4 ½ inches (11.5 cm)

Most tins were also similar in dimensions with my broccoli and tomato soup in a can.

And 10% were much larger:

There are fewer of these, but they weigh a lot more than 10%. I have some 28 oz. (800g) cans with peas, lentils, and canned beef.

For example, I have Keystone canned beef for $16/can, which contains only beef and salt, fully cooked and ready to eat; no added preservatives; no added water. If you order more than 2 of these on Amazon, you'll also get free shipping. On the other hand, it's a lot cheaper to get ground beef, which can be bought for a lot less: around $10.

L = 4 inches (10 cm)

and

H= 4 $^2/_3$ inches (11.8 cm)

All my 28 oz. cans had exactly the same dimensions.

The reason why we need these measurements and the quantity of each group of tins (four groups) is that we don't want to waste space by making only huge rows or making only thin rows for the first two groups of cans.

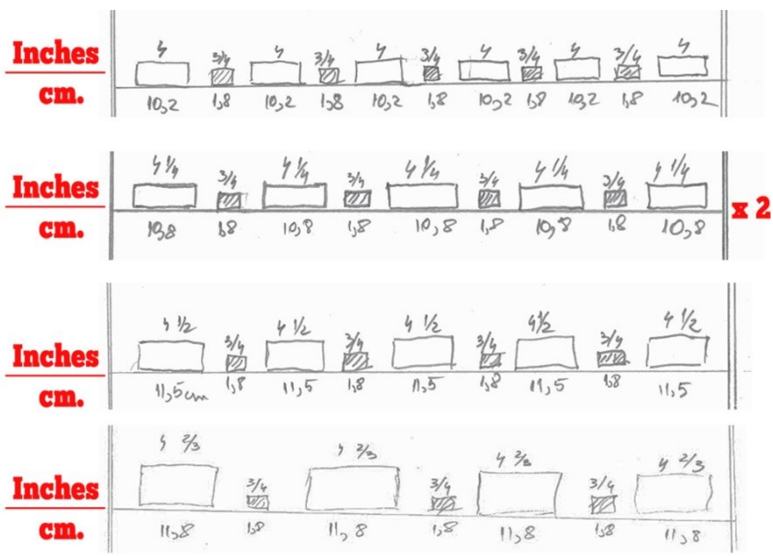
I have four groups of cans, so I'll make four types of shelves.

Designing the Horizontal Section

If your cans are similar to mine or if you want a can rotating system just like mine (same dimensions), you can skip this part and take my calculations for granted. So skip to the chapter with materials.

But if you want to personalize the can rotating system for your cans, you should see how I design it so you can chance the dimensions for your own needs.

Building the horizontal section will tell you exactly how wide the shelves will be.



Shelf 1: 28 1/4 (70.2cm) + "The Spaces"
Shelf 2: 27 1/4 (61.2 cm) + "The Spaces"
Shelf 3: 25 1/2 (64.7 cm) + "The Spaces"
Shelf 4: 20 11/12 (52.6 cm) + "The Spaces"

Because all shelves should have the same width and because they should also have spaces, I chose a **shelf of**

29 and $^{1}/_{2}$ inches (75 cm)

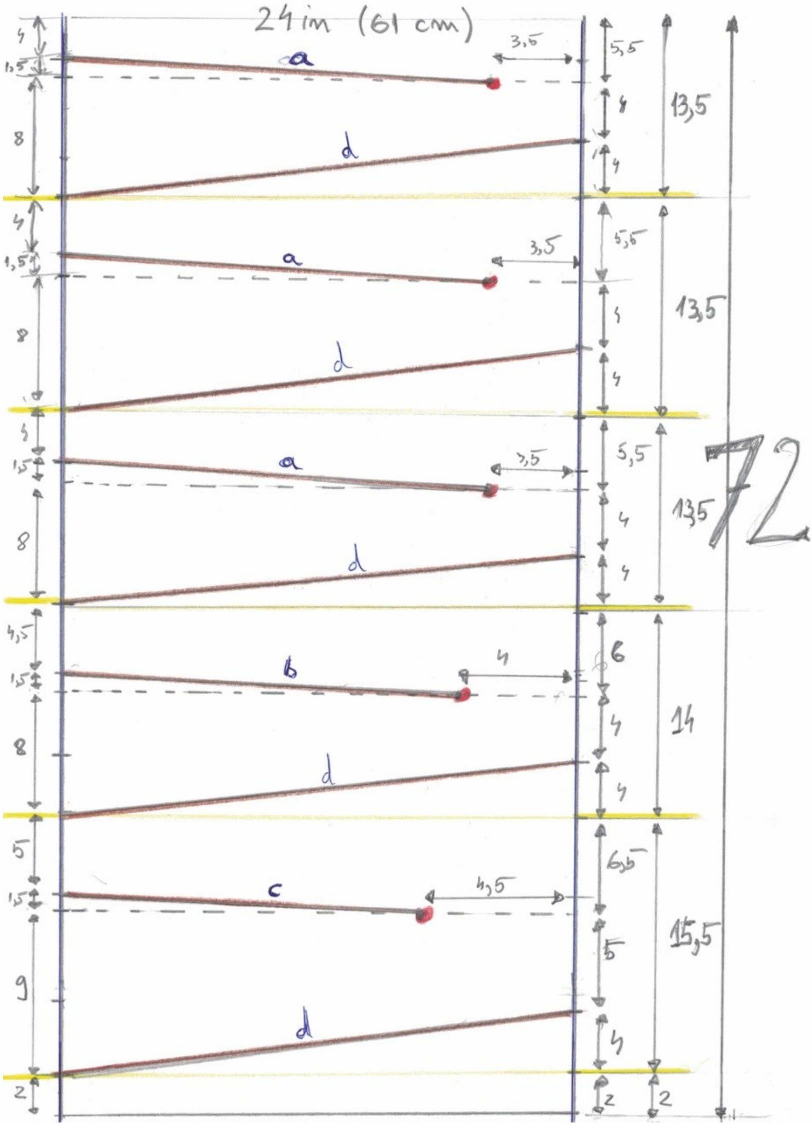
Designing the Vertical Section

In my case, which could very well be your case, I chose to build one shelf for the smallest tins (like the corn), two shelves for my most common tins (like the beans—you can see in the picture on the previous page, x2), one shelf for my medium cans (like the pineapple), and one last shelf for the largest cans.

This is the most important part of the project, not because this is when you choose the height of the can rotator (which is true) but because this measurement (the next picture) will be used on almost the entire project. So you may want to print the next page before you start working.

I chose a depth of 24 inches (61 cm) for the can rotator. Why? Because it fits perfectly in one of the spaces I have available for it, because it offers a good fall for the cans, and because it's almost an integer in cm.

In the picture, you'll see that you have five modules marked with yellow. You can also see 10 boards: 3a, 1b, 1c, and 5d.


24 in (61 cm)
a
d
a
d
a
d
b
d
c
d
3,5
3,5
3,5
4
4,5
5,5
4
4
13,5
13,5
13,5
14
15,5
72
6
6,5
5
2
8
8
8
8
9
1,5
4,5
5

These dimensions were chosen so that all cans can fall and "sneak" through all the gaps.

The depth of board **a** can be calculated using the Pythagorean theorem:

$$a^2 = 1.5^2 + (24-3.5)^2$$

<u>a ≈ 20.5 inches (52 cm)</u>

The depth of board **b** can be calculated also by using the Pythagorean theorem:

$$b^2 = 1.5^2 + (24-4)^2$$

<u>b ≈ 20 inches (50.8 cm)</u>

Using the same formula for c:

$$c^2 = 1.5^2 + 24^2$$

<u>c ≈ 19.5 inches (49.5 cm)</u>

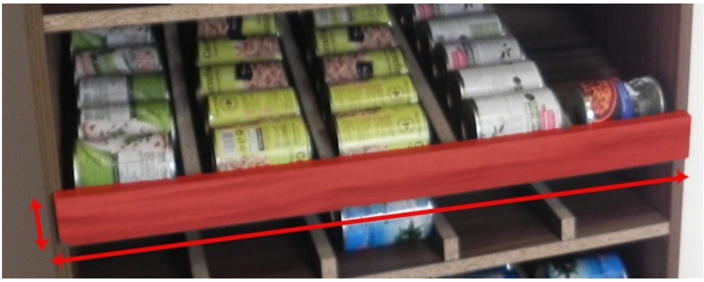
And d:

$$d^2 = 4^2 + (24-4.5)^2$$

<u>d ≈ 24.3 inches (61.7 cm)</u>

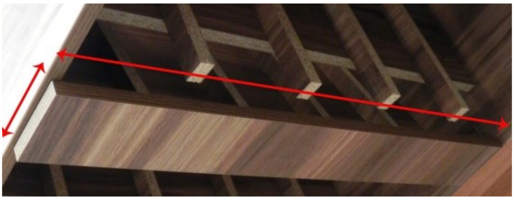
By adding the height of every module and the 2 inches (at the bottom of the section), you'll get a total **height of 72 inches (183 cm).** If you add the casters, the total height will be even higher.

The boards that are meant to stop the cans from falling have the length equal to the can rotator's width plus the thickness of two boards, which means **$29\ {}^{1}/_{2} + 2 * {}^{3}/_{4} = 31$ inches (78.5 cm).** I chose a height for these boards of **$2\ {}^{1}/_{3}$ inches (6 cm).**



Only the board for the biggest cans has a height of 4 inches (10 cm).

The boards from the back of the can rotator are meant to stop the cans from falling when a can module is more than half full.



(They won't fall only from the speed that they get from the slope.) All these boards will be 4 inches high (10 cm), and they'll have the length of the can rotator's width plus two times the thickness of the boards = **29 $^{1}/_{2}$ + 2 * $^{3}/_{4}$ = 31 inches (78.5 cm).**

And you'll also need four boards for the castors:

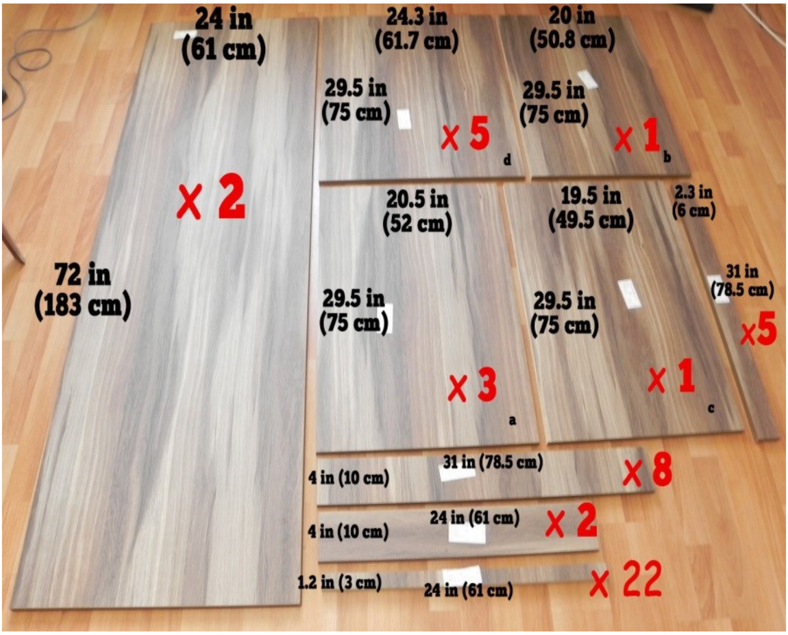
Two boards will be the width of the can rotator plus two times the thickness of the boards: **29 $^{1}/_{2}$ + 2 * $^{3}/_{4}$ = 31 inches (78.5 cm).** Their width will be **4 inches (10 cm).**

Another two will have the can rotator's depth: 24 inches (61 cm) and 4 inches (10 cm) in width.

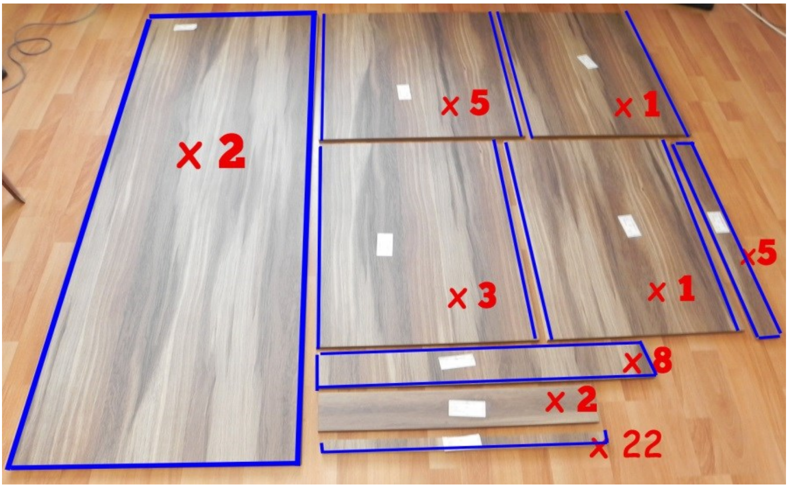
Materials and Tools

So far we've managed to calculate the dimensions for all the boards. So the next thing to do is to go buy them. In the images below, you'll find exactly what you need, so print them before rushing to make the purchase.

The model for my particle boards is San Remo (A423), but you may choose something else of course.



With veneer on blue parts:



Please note that when I built my can rotator, I made some mistakes. This is why my can rotator doesn't have veneer on all exposed parts. But don't worry, with the image on the previous page, you won't have any issues.

The largest two plates have a different kind of veneer: the thickest (1/8 inches or 4mm). For other plates, I chose a normal veneer (less than 1/16 inches or 2mm).

You'll need around 200 small particle board screws. (They were the smallest at my Home Depot). They shouldn't be longer than the thickness of the particle boards.

You'll also need 16 larger screws (at least one inch in length).

Add around 60 brackets (90-degree angle). You can order them on Amazon.

And don't forget the castors and the screws for the castors as well as wood glue. That's about it.

As far as woodworking tools, you'll need only a small drill and a screwdriver.

Measurements

Print the picture from page 13, grab a pencil and a ruler, and start marking all the measurements on every side as well as the red dots. This is very important. If you don't mark them correctly, the whole project will be doomed.

I used a paper scotch tape and marked every measurement on it. Maybe you can see it clearer here:

This is actually a zoom of the right lower corner of the board.

Two inches from below, then 4 inches, then 5 inches, and then you need to place the dot. (In the graphic, this is the red dot.)

I recommend you start by marking the 2 inches on both sides and then mark all five modules (yellow line on the graphic).

Then divide all modules according to the graphic from page 13.

For European measurements:

Instead of:

1.5 inches, you'll use 3.8 cm

2 inches, you'll use 4.9 cm

3.5 inches, you'll use 8.9 cm

4 inches, you'll use 10.2 cm

4.5 inches, you'll use 11.4 cm

5 inches, you'll use 12.7 cm

13.5 inches, you'll use 34.3 cm

15.5 inches, you'll use 39.4 cm

19.5 inches, you'll use 49.5 cm

20 inches, you'll use 50.8 cm

20.5 inches, you'll use 52 cm

24.3 inches, you'll use 61.7 cm

Testing the Design Before Building It

Just to make sure the cans won't get stuck anywhere along the way, this is the best moment to test the design using your cans.

Take 20 of your smallest boards, and place them on the large board exactly how boards a, b, c, and d will be placed using the marks you've already made.

Then you should look for flaws in the design, if there are any. It should look something like this:

You need to check to see if you left enough space to introduce the cans and if the gap is large enough for them to fit in.

Transposing the Measurements From One Board to Another

If you've just tested your project and it's okay, the next step would be to mark all those measurements on the second large board.

Here is a good method:

Just place the boards one next to each other, and with a ruler or using a small board, transpose the marks. You'll need to do this for each part, so you'll have to change boards around among themselves.

Don't try to do this:

Gluing the Delimiters

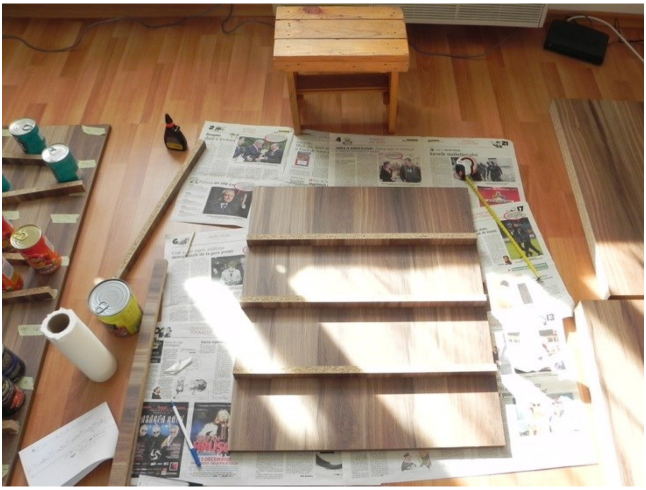
The delimiters are the smallest boards.

They should be glued on boards a, b, c, and d according to the modules that we built. See the picture from page 11 (horizontal section).

I started with the lowest module (the one for the biggest cans). The lowest module has only three delimiters per shelf, so the lower shelf (plate d) will look like the one in the picture on the next page.

The newspapers are, of course, to not stain the floor with glue. The small chair helped a lot too.

And you'll also need some napkins to wipe the excess glue that will appear once you press the delimiters.



First, you'll need to divide the board into three to six equal parts, depending on what module you are building. Then draw a line on every side of the delimiter.

Here is where you'll draw a line with the glue:

Place and press the delimiter for 10 seconds:

Wipe the excess glue:

Okay. In the pictures, there were only d-type boards, but the rest of them will look like this:

Don’t worry. This is how they are supposed to be.

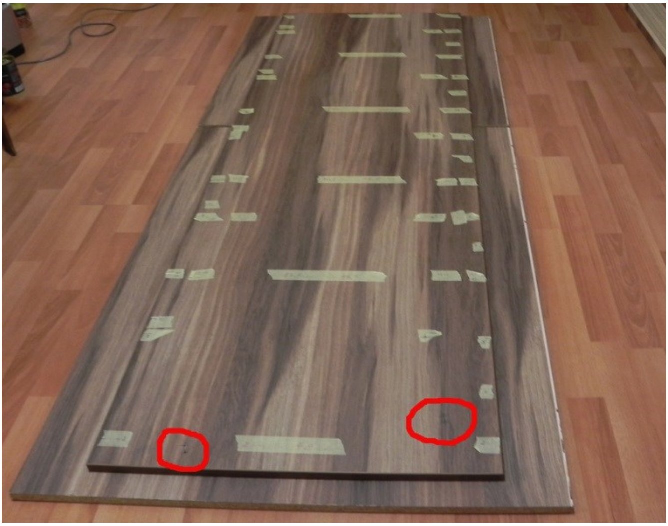
Assembling the Shelves

First, we'll need to screw the lower board into place.

Because it's pretty hard to hold a "d" board in place, I encourage you to make the marks using the small boards, like this:

Important: You can play a little bit with the distances. You might want to fix the board at the end of your measurements to offer more space for the rolling cans.

I had some big spare parts from the particle boards, so before drilling, I put them underneath the plate jut to make sure I wouldn't drill my floor. Here are the marks:



Drill all four holes:

I always use a vacuum cleaner immediately after:

Screw the brackets in place:

With one hand, hold the board, and with the other one, mark the place where you need to drill.

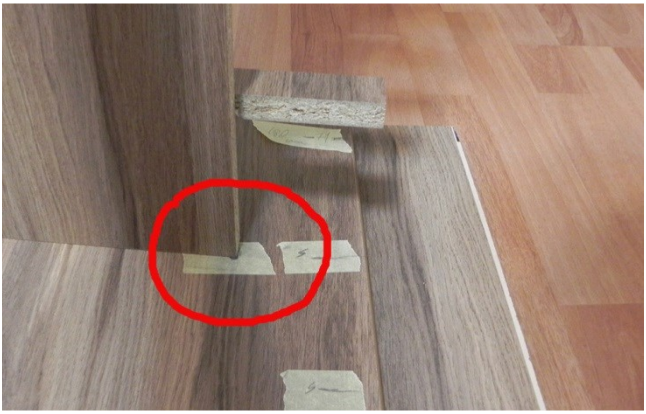
Place the board upside down, and drill the four holes:

Again, hold the particle board with one hand, and screw it in place:

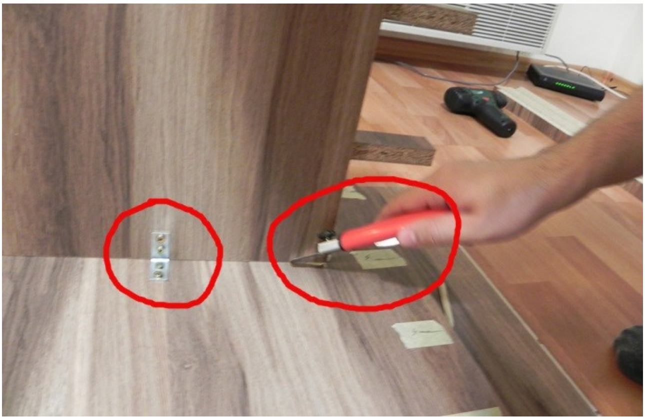
Your project should now look something like this:

Next step: screwing in place the upper shelf—“a” for the smallest cans. You can use the same technique for this one too:

Pay close attention to the point you’ve marked on your big board. I almost always position the boards just above the dot:



Use a cutter to cut the excess tape if it does not come off easily. Also, it is very important to remember not to place the brackets very close to the edge because they might get in the way of your cans:



For the “d” plates, you can do exactly the opposite by placing the brackets very close to the edge, just above the place where the cans will fall.

The next thing to do is to place the second big board above the two plates you've just installed so the points and measurements match exactly:

From underneath it, mark the places for the screws on the upper board and the second board:

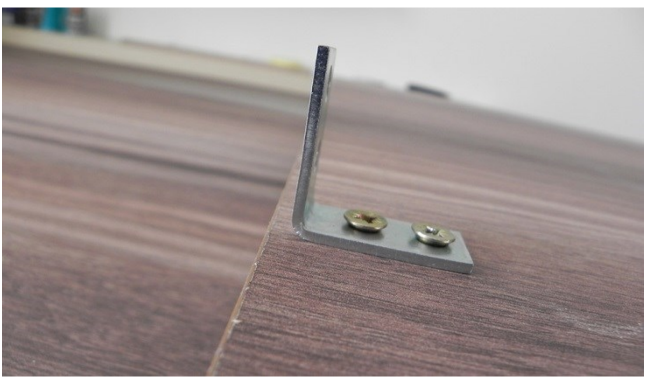
Again, use the vacuum cleaner, drill the holes, and screw the brackets in place:

Now do exactly the same thing for the lower board:

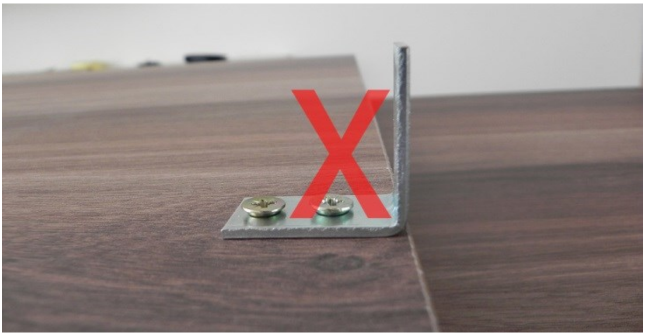
Below, you'll find the easiest procedure to follow for screwing the inner boards in place:

You'll start from above and screw board by board until you screw the last board (board "c"). So the next board you'll screw is a "d" board next to your upper board. If you don't do it in this order, you'll soon find out that you won't have enough space to comfortably screw the brackets.

First, place the next board that you want to add on the big board above, and with the help of one bracket, mark the holes you need to drill. Don't place the bracket too close to the edge of the boards. Below, you'll find a close-up of its final position. You can see that there is a very small distance left…something like a millimeter or $^{1}/_{24}$ inch:



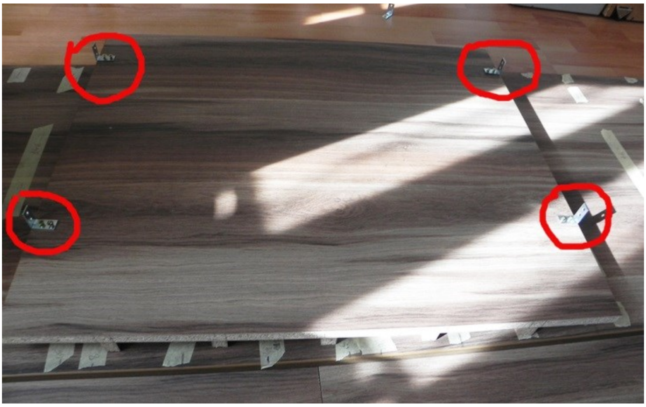
Too close to the edge:



The next step is to drill all four holes:

(Don’t worry about the fact that I’ve already screwed most of the boards, as seen in the picture; I came to the conclusion that this was the easiest procedure after a few tries, so I took the pictures when I had only two more boards to put in place.)

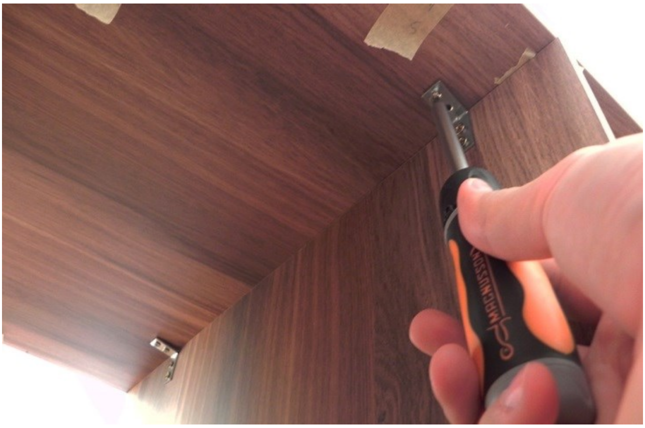
Screw all the brackets in place:



Place the board into place, and mark the spots where you need to drill the holes (on the two large plates):

Push the board a little bit behind so you can drill the holes, both below and above. (In the image, you can see the holes I drilled in the big board below.)

Screw the board in place:



Your working space will become smaller and smaller, and you'll find it a little bit difficult at some point…

…but there is still something you can do. You can loosen up the screws from the board below:

Installing the Castors

You don't need to install the castors, but if you want to, follow the guide below.

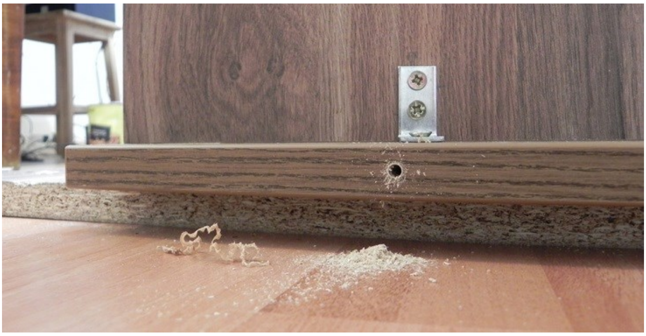
In order to install the castors, you need to place the two 4x24-inch boards together with two 4x31-inch boards in a "#" shape. Because the man who cut my boards made a little mistake, I had to first place the 4x24-inch boards and then the 4x31-inch boards.

But the most stable structure is obtained by screwing the larger boards first.

Here is where you'll use the larger screws.

You'll also need to change the size of the auger.

Mark and drill holes in the edge of the large boards:



I screwed in the smaller boards, but you should screw in the large boards first (vertically, not horizontally like I did).

On the other board, screw in the canisters first:

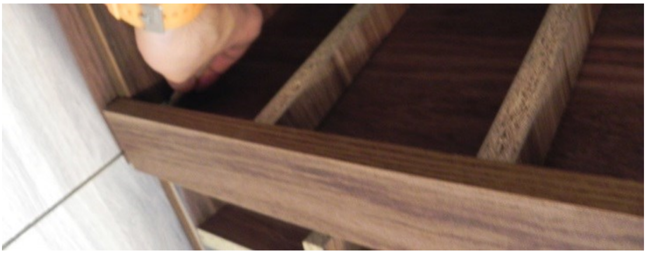
And then screw it (using the large screws) to the other board:

Screwing the Back and Front Wooden Stoppers

The front stoppers are the 2.3x31-inch boards. Mark and drill the holes for the brackets:

Screw the brackets with only one screw:

Place the stoppers in their place, and mark the spots where you need to drill:



Screw the stopper in place:

For the last stopper, use a 4x31-inch board:

For the back stoppers, you'll use only 4x31-inch boards using exactly the same method.

Here is the can rotator with three back stoppers:

After you screw in all five back stoppers, you can raise the can rotator: