

Built of a Rattan Indian Style Bow

Author: Rolf Gerschwinat

Translation and drawing: Roland Sawicki

Introduction:

For quite a while now the material gained some ground as a bow building material. Rattan (also known as Manau) is a liana with nearly unlimited availability at affordable prices. Rattan is readily available on the market in diameters between 25 mm (1") to 45 mm (1.77") and lengths of up to 3 meters (118").

Rattan bows are especially suitable for kid's bows. The material can be easily worked even by laymen. It is very forgiving with tiller errors especially for bows with low strengths (up to 20 #).

According to my opinion it would be unfair to use Rattan only for kid's bows. I want to share these instructions to build an Indian style bow or horse bow with strengths up to 40-50# and a draw of up to 32". These bows do not lack aesthetics and efficiency. You can buy Rattan polished (outer skin removed) or unpolished (outer skin still remaining). Both can be used to build a bow but I believe the unpolished variation will give your bow more speed

Using this instruction I built several bows with strength beyond 45# and an arrow speeds up to 145fps.

Materials and tools you would need:

1 Rattan cane, > 40 mm (1.57") in diameter with a length not more than 150 cm (59 ")

A planer

A knife

A work bench with a vise or a couple of clamps

Various files and rasps

A tiller board

A spring scale

Sanding paper 80 to 240 grid

For the finish and decoration:

Leather for the handle

Pieces for fur as a silencer

Needle and thread

Varnish and brush

Horn or antler of the tip overlays (Optional)

For the bow string

Dacron B50

Serving string

For the tiller and steam bend of the tips: Patience

Step 1:

Measure, mark and plane

Measure the dry Rattan cane and mark the center line along the length of the cane and the grip area. Pay attention to the natural bend of the cane and include in your design (the canes are not always perfectly straight).

For a short bow like this move the grip section towards the lower bow limb with a ratio not more than 3/5 to 2/5 otherwise the bow would look too asymmetrical.

Apply all the markings at the side of the stave.

For beginners it is highly recommended to achieve a rectangular cross section over the entire length of the bow limbs. To avoid twist the bows limbs should be rather wide and flat than thick and narrow.

For a bow with a recurved length of ~ 130 cm (51"), the median thickness of the limbs should be between 1,5 cm (0.59") and 2,2 cm (0.86"). Of course these measures determine the bow strength. I took these measures from a bow I built with 57# and a draw of 28".

Now clamp the cane and plane from the grip section towards the end of the bow. Stay away about 3 cm (1.18") from your grip markings. You will get to a width of about 38 mm (1.5") at the ends. Repeat this on both limbs and at the back and belly of the bow. The result should look like two flat truncated wedges attached to the grip. The thickness of the flat ends at the bow tips should not be more than 15 mm (0.59")

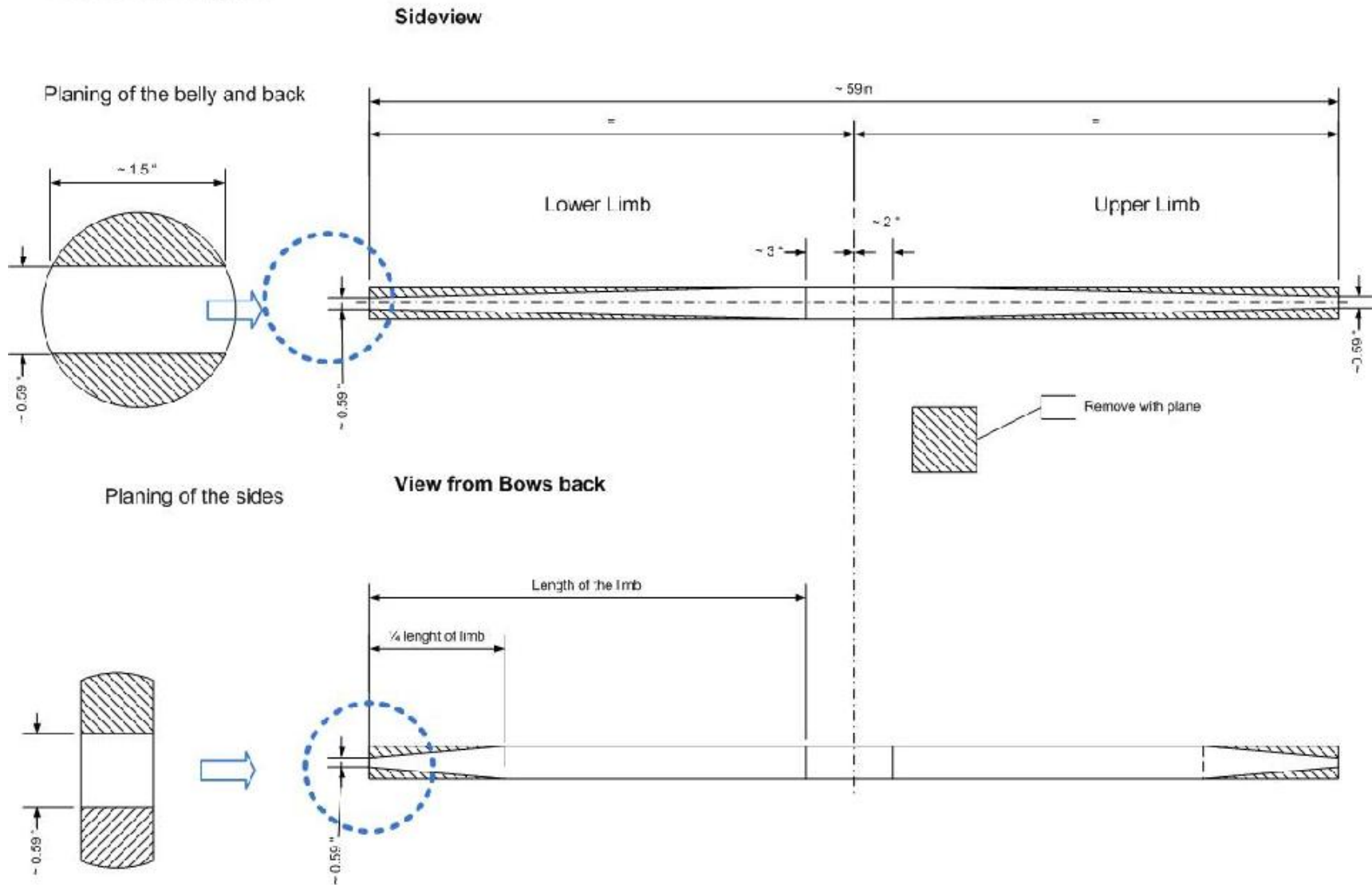
Pictures: 1, 2



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Drawing 1: Layout

Dimensions and plane



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Step 2:

Plane the outlines

Transfer the markings for the grip to the back and belly of the bow. Mark a line from the end of the bow. The distance is about 1/4 of the length of the bow limb. Mark a center section at front end of your limbs about 1.5 cm (0.59") but not more than 1,8 cm (0.79") wide. Now mark the outline of the bow, connect the center marks to the line drawn before.

Plane away the side sections. Smooth the sides and start rounding the edges at the bows belly. You will not touch the grip section. You now have a bow with flat limbs and pyramidal ends.

Now you can cut the nocks for the bow string at the sides of the limb. Cut them about 1,5 cm (0.59") away from the ends at about 45°. Do not cut into the back of the bow.

Pictures 4 and 5



Step 3

Make the bow string

I make the bow string in my preferred way using a Flemish splice. The yarn used is Dacron B50. For a bow with a planned strength of 45# a bow string with 12 strands would be required.

To avoid splicing errors and of course it's also looking good I use two different colors of yarn (e.g. black and white). You can vary the combinations of mixing the colors 2 bundles of white and 1 bundle black, one bundle white one bundle black or completely mixed up.

The bow string should be about 1.4 times the length of the bow. A loop at one end and a bowyers knot at the other end. This way you can use the bows final sting to tiller the bow.

Picture 6: looped end of bow string



Step 4

Rough tiller of the bow

Carefully align the bows grip section to the outline of your bows limbs. You can use a rasp or a sharp knife for the job.

Optionally you can make an arrow shelf between grip and upper fade out. The shelf is not a real requirement although the arrow will move closer to the center bow when used.

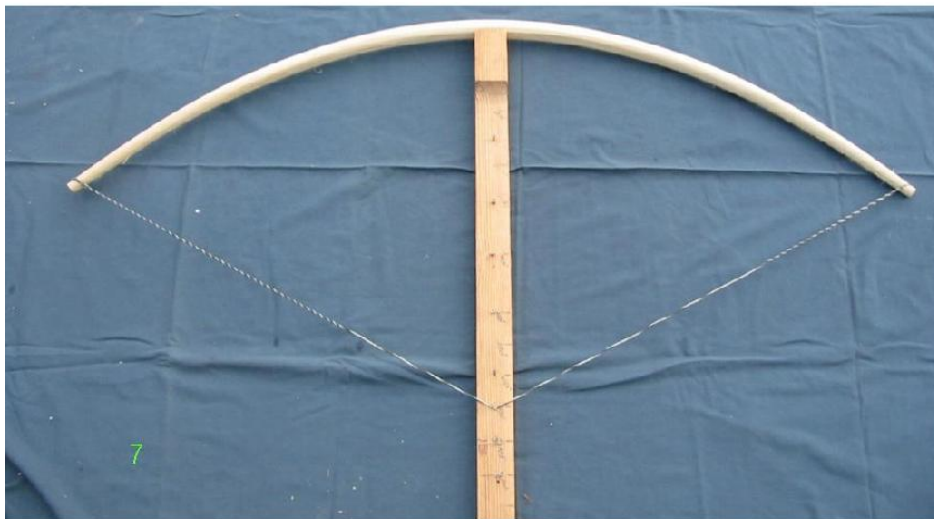
Now put the string in the bows notches. The string should fit lightly without any tension. Check your bow at the tiller board for the curvature.

Start tiller your bow at the belly side of the bow. Carefully remove material with a rasp and also pre-round the still sharp corners of the bow especially at the belly of the bow. Be patient do not remove too much material at one pass, its better to check more often. Every time material is removed draw the bow about 10-15 times to get the materials used to bending (be careful do not fully draw the bow immediately)

The result should be a consistent round curve from the grip to the bows tips. The strength after the first tiller passes should be about 40#.

Rattan has fibers and when mechanically worked with a plane or rasp these fibers will stand up. Don't let yourself carry away pulling these fibers out of the stave. Almost certain you will pull out more material out of the stave and create ugly grooves. If you don't like the fibers slightly sand them away.

Picture 7



Step 5

Steam bend the recurves and deflex

Now the time has come to bend the recurves to give your bow the longed for strength and arrow speed.

I use an old electrical water kettle (but any old pot with a heat source will do as well). The pot/kettle should hold enough water to produce enough steam needed for steaming the brecurves. I fill the pot about with water about 2" below the top and bring it to a boil. Place the tips of your bow (yes you can already call it a bow at this stage) over the boiling water. Make sure that the section where the bend will be is exposed to the steam

Cover everything with an old kitchen cloth to trap the steam around the bow. Steam the tips between 5 and 15 minutes. The time required is depends on the quality of the Rattan and the thickness of the tips of your bows limbs. It is important to always keep the water at a boil to have a constant flow of steam.

After about 10 minutes take the bow from the steam and bend the recurves. Be careful the Rattan will be very hot. I take an old cloth or some leather gloves to protect my hands but still be able to have enough feeling in my hands in the contact to the bow.

Bend the recurves towards the bows back at an angle of about 45°-55° to the bows limbs. The recurves should have a length of about 10cm - 15 cm (4" - 6"). Press the tips of the limb carefully and without force to the floor. Now increase the pressure until the recurves bend. Hold until cooled down. Bear in mind that the recurves flex back about 10%-20% The bend should be round and smooth without any sharp bends. The recurves shall also be static.

If unpolished Rattan is used no compression creases shall be visible at the bows back

When both limbs are recurved it is time now to steam bend the middle of the bow.

The same process is used as for the recurves only now a slight deflex is bend into the bow. This deflex is useful at the final tiller stage of the bow. Without the deflex the bows recurves might tend to flip or twist sideways when strung up. On the other hand a deflex makes for a smoother draw.

Pictures: 8, 9, 10



Step 6

Final Tiller

Let the bow sit overnight at a warm place so it will lose the moisture it took up during the steam bends. Now the final tiller stage of the bow can start.

Shorten the bow string using a bowyer's knot until you can string the bow to desired bracing height

It might or will happen that the bow twists if you attempt to build. But Rattan has a great advantage. Possible twists / limbs misaligned from the center line can be easily straightened using steam.

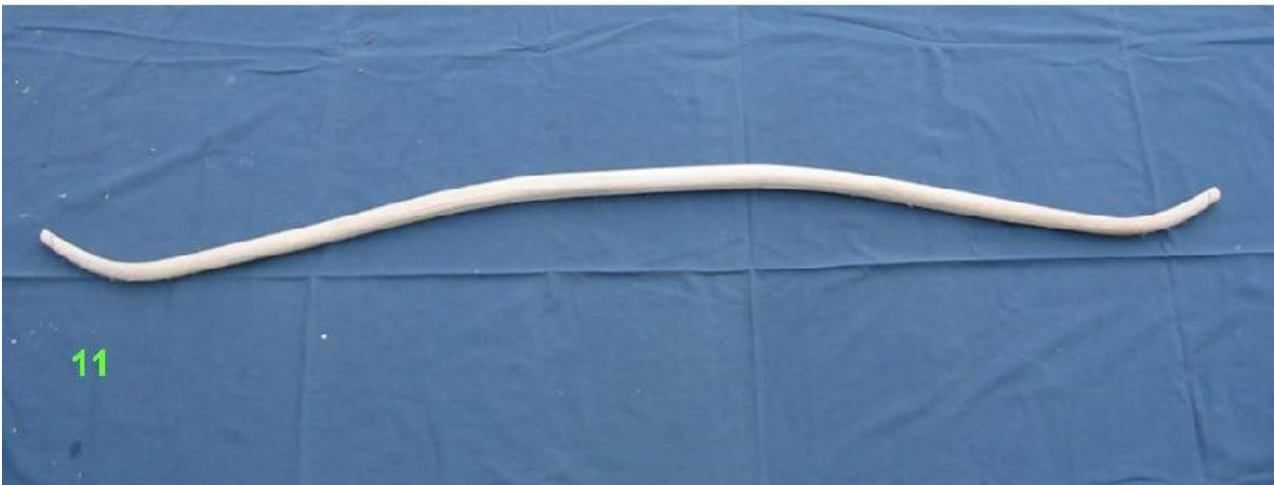
Again once more the advice the wider (and flat) the limbs the less the risk of twists.

The final tiller can be achieved by rounding the limbs at the belly and removing material as "stiff" sections.

If material has been removed draw the bow 15-20 times so the material gets used to bending and to make changes in the curve visible. (Rattan is no different than wood in this regard)

If the bow's strength is too weak shorten the bow's length to about 140 cm (55"). This step can be done after tempering the bow.

Picture 11



Step 7: Tempering

When the bow has reached the desired strength the final finish can be started. An additional 5# - 10# of strength can be achieved by tempering the bow.

Tempering means "baking" the material. There are 2 prove methods that are explained here. One watch out with tempering: the longer the bow is heated the more brittle it will get.

1. In the oven

The limbs can be tempered using a forced air oven at about 120°C - 150°C (248°F - 302°F). The oven door needs to be covered with kitchen cloth to trap the heat in. Starting with a temperature of 100°C (212°F) the temperature needs to be slowly increased in steps of 10°C (50°F) to avoid longitudinal cracks in the grip section. These cracks are not dangerous but unsightly and also avoidable. Do not temper longer than 10 minutes. Also treat both limbs with the same temperature and duration.

2. Using a hot air gun

If no oven large enough is available a standard hot air gun can be used to temper. It is important to control the heat so no scorch or brown marks will develop on the surface. So be careful! One advantage of this method is that soft sections in the limb can be selectively tempered. Also with this method it is important that the temperature and time exposure of both limbs is the same.

Now overlays made of horn or antler can be glued to the tips. Use epoxy glue showed best results and of course glue after the heat treatment to avoid the risk that the glues softens and loosens in the heat.

Picture 12,13



Step 8 Finishing touches

Now it is time to give the bow the final touches though these might not be necessary if you worked thoroughly during the previous steps. In any case from now on only use a scrape or sandpaper.

Sand the bow with a 80 grid sandpaper to remove all scratches, rasp marks or grooves. Finally sand the bow by gradually using finer sandpaper up to a grid of 240.

After dust removal the first layer of varnish can be applied. I prefer varnish. Varnish prevents the Rattan fibers from sticking out when the bow is drawn. It basically binds the fibers and keeps a smooth surface. But I also know bowyers that oil their Rattan bows. When the varnish is dried sand the bow with 240 grid (or finer) sandpaper to remove the fibers that will stick out after the first application of varnish. Now the second layer of varnish can be applied. If necessary repeat sanding and varnishing one more time. Now the bow should have a golden shimmer.

To apply the silencers string the bow and mark the string about 15-18 cm (6" - 7") from both tips. Use some Dacron B50, a needle, roll the fur pieces around your bow string at the marks and stitch the fur to the string making about 3 passes thru the string.

At last wrap the grip leather and the center serving of the string

Pictures 14,15



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Although I have some fine bows made of yew, osage orange and hickory in my collection it is always fun to shoot the lightweight but still fast Rattan bows. Have fun building bows using these instructions

Regards

Rolf Gerschwinat „Broken Arrow“