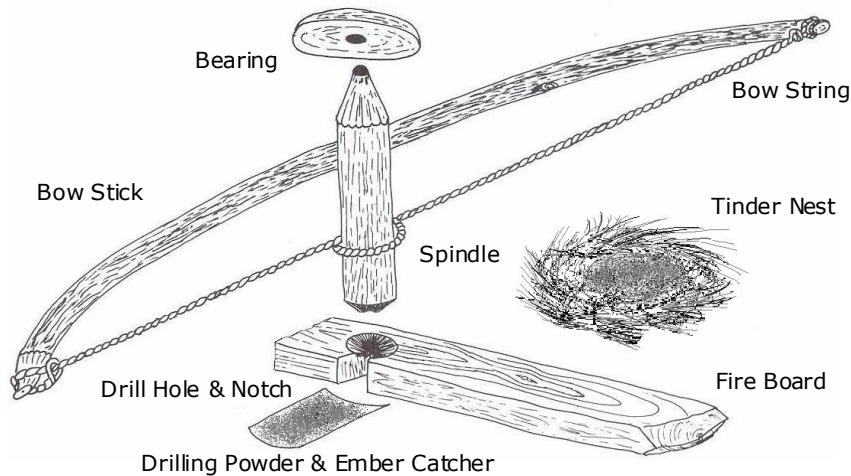


The Fire Bow



Let's show you how to make a friction fire that works, using the fire bow.

First the basic theory for a friction fire:

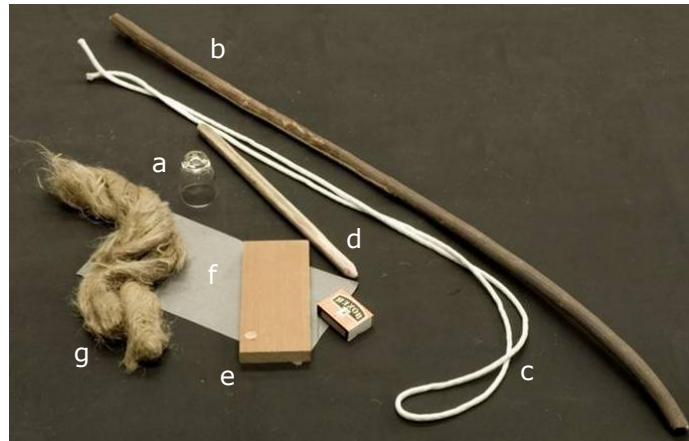
Rub your hands together, ok push harder and rub faster, yes they are getting hot due to the friction, continue and you will get water blisters due to the build-up of heat. The same principle applies when you rub two pieces of wood - hard, fast and with lots of friction together, however the end-result is the formation of very hot smoking black wood powder. Add oxygen - thermal runaway then takes place and finally the formation of a glowing red hot ember to start your fire.

Now the working parts of a fire bow set as per diagram above:

The **spindle** inserted into the **bow string**, is pushed down via the low friction **bearing**, with the one hand (normally left), into the **drill hole and notch** in the **fire board**, which is situated above the **drilling powder and ember catcher**. The spindle is then rotated to produce hot black wood powder onto the drilling powder and ember catcher via and into the notch by friction in the drill hole, first in the one and then the other direction, by the pull action of the bow string that is connected to the **bow stick**, which is being pushed and pulled by the other hand resulting in the energy transfer action. The **tinder nest** is used to nurse the ember into a fire. That's the basic workings of the fire bow. Yes, this sounds a bit confusing ... however once you start putting the whole lot together it will make sense.

Remember, at this stage you still know squat, and guaranteed you will not be able to get a friction fire going with the above knowledge. Been there got the tee-shirt etc. You first need to get started with a simple fire bow set that will work well, so as to get the feeling. Then only should you start experimenting and go full traditional, using more natural products.

Well let's get things on the road - firstly here is your shopping list.



List of items needed for your first fire bow set as per photo above:

- a) Tot-glass and role of duct tape to make the **bearing**.
- b) Pliable moist wooden stick, about middle finger thick, with a fork at one end, slightly curved and cut to arm length for the **bow stick**.
- c) Strong Para-cord, one and a half arm length for the **bow string**.
- d) Dry Maranti wooden dowel, middle to thumb finger thick and about the length along your hand for the **spindle**.
- e) Dry Oregon pine wooden board, middle to thumb finger thick, three fingers wide and about the length along your foot for the **fire board**.
- f) Piece of thick wax paper to **catch** the **drilling powder and ember**.
- g) Piece of hemp to make **tinder nest**.

Note: The box of matches is intended to give an idea of scale and not to start your fire with ...

You will also need a good medium sized sharp knife - one with a small saw attached is ideal (having locking blades is safest). Lead pencil or pen could also be handy when marking out the drill hole and notch.

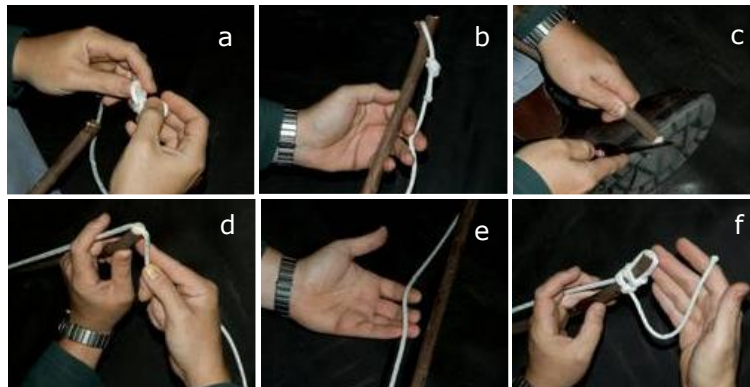
Now let's make a "lekker" (nice) fire. You won't believe the satisfaction of getting it going, thus don't give up, promise if you persevere **IT WILL WORK**. Further, in the beginning get someone intelligent, without two left hands and who has the perseverance without moaning to help you.

This is how you make your first friction fire using the fire bow:

Step 1: Generously wrap the tot-glass with duct tape, as per photo (a). The tape is there to help protect you just in case the tot-glass breaks for some or other reason, better to be safe than sorry. Ok, now you have your low friction bearing as per photo (b).



Step 2: To make the bow, tie a figure of eight knot with loop on the one end of the bow string, as per photo (a). Place the loop over the forked end of the bow stick, as per photo (b). Cut a "v" slot, big enough for the bow string, into the other end of the bow stick, as per photo (c). Note: You can use your shoe for a work bench, as shown in photo (c). Place the bow string into the "v" slot, as per photo (d), then pull to take up the slack until the bowstring is still hanging slightly loose, as per photo (e). Now, tie the loose end of the bow string back over, using half hitches, as per photo (f). You can adjust the length of the bow string by sliding the half hitches up or down.



Step 3: Take the dry maranti wooden dowel and cut the one end to a 60° conical point, as per photo (a), so as to form the spindle bearing point. Note: Using your knife as shown in photo (a) gives you stability, control, and also adds to safety. Now, cut the other side of the spindle flat, and round of the edges slightly, not to much, this forms the drilling part of the spindle. Now, make a hole with your knife point into the drilling part of the spindle, about a third of the diameter of the spindle wide and deep, as per photo (b). The end product can be seen in photo (c). The reason for the hole in the middle is scientific, yes believe it or not. When you rotate a wheel the middle moves less distance, thus slower when compared to the outer edge. To optimise the drilling part of the spindle we remove the inner less effective section, so as to focus all of our energy on the faster moving outer side.



Step 4: Loading the spindle correctly into the bow is important. Take the spindle in your left hand and hook the drill through the bow string, as per photo (a). Twist the spindle backwards and hook the bow string, as per photo (b). The spindle should now be slightly spring loaded, as per photo (c) if not adjust the bow string tension using the half hitches (as previously explained above). It is important that the spindle is on the outside of the bow string, and not between the bow string and the bow stick. Further, the less the bow curves the better, as you will have more

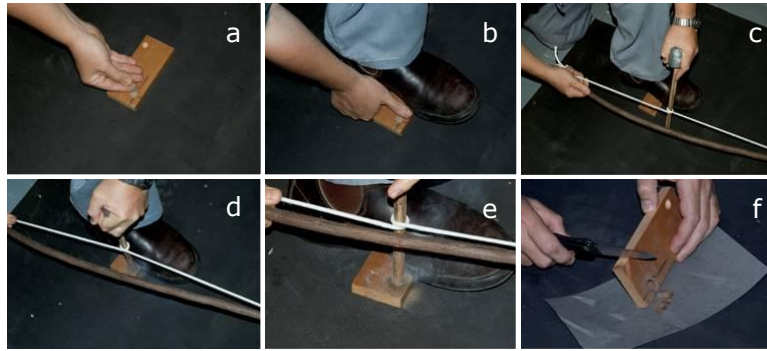
control. The bow string must not be too tight, or else the spindle will be difficult to handle, as it would twist and jump all over the place, further the excessive friction with the bow string can result in the string breaking.



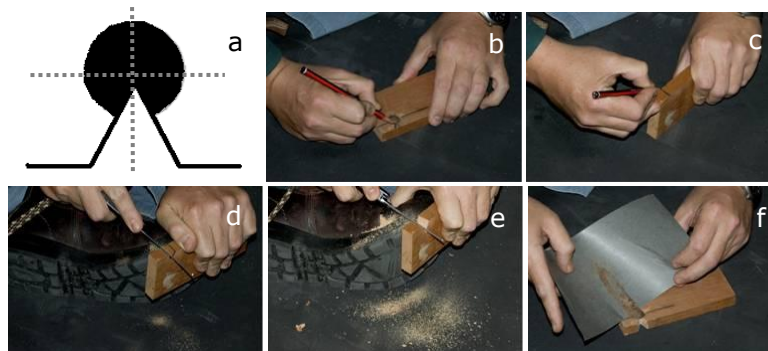
Step 5: Let's mark out and start to prepare the fire board. Place the spindle onto the dry Oregon pine wooden board and draw a pencil line, as per photo (a). Draw a second line about two spindles wide vertically across the first, as per photo (b). Make a 15° conical hole with your knife, using a twisting action, into the wooden board at the crossing points of the two lines, as per photo (c). Note: Using your thumb at the knives point, as shown in photo (c), gives you good control and also helps with safety.



Step 6: We need to "burn-in" the drill hole for the fire board. Fill the conical hole you made with your knife with dry small grained sand, so as to increase the friction, as per photo (a). Place the bridge of your left foot onto the fire board, about one thumb distance away from the conical hole, as per photo (b). Your right knee should be behind, and in line with the ankle of your left foot. Make sure you are comfortable. Now, load the spindle onto the bow string (as described in step 4 above), holding with your left hand the tot-glass bearing on top, and the bow with your right hand, as per photo (c). Place the drill of the spindle into the sand filled conical hole, as per photo (d). Hold the spindle up-right (90° to the fire board), and push slightly down with your left hand, while securely holding the tot-glass bearing. To make life easier support your left hand by holding it against your left leg, this will help prevent your hand from moving all over the place once you start with the drilling action. Ok, now you can start "burning-in" the drill hole. Rotate the spindle by rhythmically pushing and pulling the bow, in a "sawing motion". Don't forget to breathe, yes some folks are so focused they faint, breathe in when you pull the bow and exhale when pushing. Now, if the spindle does not rotate, slightly decrease the downward pressure, or if the bow string is slipping on the spindle, increase the bow string pressure by squeezing it with your right hand onto the bow stick. If the drill makes a squeaking sound, increase your downwards pressure, until the sound disappears. Ok, keep on drilling, smoke will start to come from the drilling hole, as per photo (e), and stop once a black (or dark brown) drilling powder forms. Carefully remove the spindle from the drilling hole and tap the black drilling powder from the fire board onto the drilling powder and ember catcher, as shown in photo (f).



Step 7: Great, you have a “burnt-in” black drill hole on your fire board. Now, you need to cut a 30 to 45° “v” notch, as shown in drawing (a), into the fire board at the drill hole. Note: The “v” notch does not reach the centre of the black drill hole it’s about one third away. First mark the “v” onto the fire board, as per photo (b), also mark the sawing lines, opening up slightly in the form of a dove tale away from you, on the side of the fire board, as per photo (c). The reason for this shape is that when you have generated the hot black smoking drilling powder in the notch you will need to pick-up the fire board without disturbing the pile. This slanted edge “v” notch was found to be best. Carefully cut out the “v” notch along the lines, as shown in photo’s (d) and (e). Note: Using your shoe and left hand as a make shift vice helps. Throw back the black drilling powder and ember catcher into the drilling hole, as per photo (f).

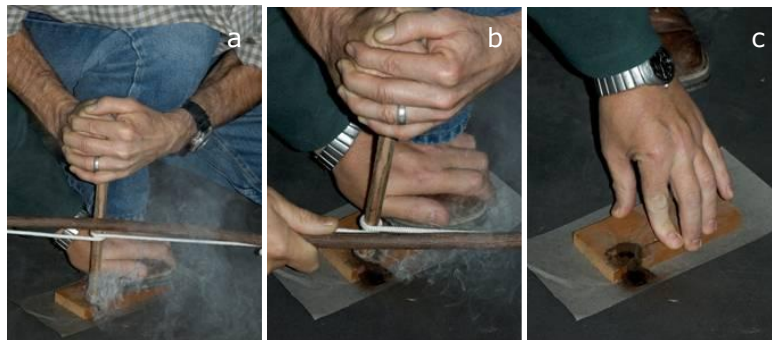


Step 8: We need to prepare the tinder nest. Take a piece of hemp and pull and divide it into small tufted-up pieces, like cotton wool, as per photo (a) (make sure you do a good job, the finer the better, as you will be sorry later if not). Note: Keep the hemp residue that falls below. Now, shape the plucked out hemp into the form of a birds nest, as per photo (b), and throw the fine residue into the centre. You will be making far better tinder nests from all sorts of natural materials later – however, we must first get you going using this simpler one.



You are now ready to make the hot powder created from the drilling action, which will then be nursed into a red hot ember by carefully adding oxygen. This is the ember that will be introduced into the tinder nest to finally start the fire with.

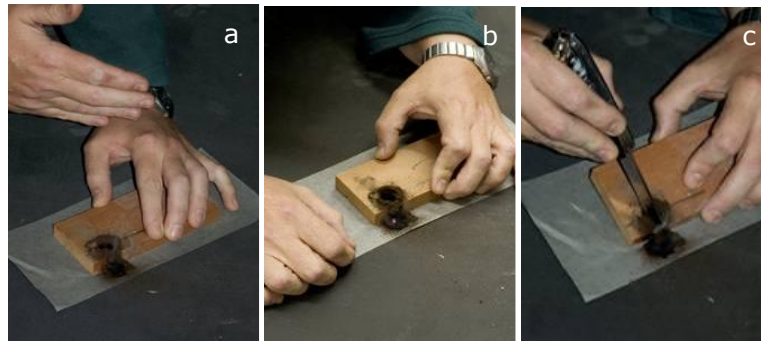
Step 9: Let's get some hot smoking black drilling powder. Place the drilling powder and ember catcher onto a level firm surface, with the fire board above. Repeat step 6 above, but remember you already have drilling powder in the drill hole, and don't stop when more black drilling powder forms, as per photo (a). Continue, until the "v" notch completely fills, and pushes a heap outwards, with black drilling powder, as per photo (b). Keep this up, yes you will be sweating and breathing hard by now, until the black drilling powder is hot enough to smoke by itself, indicating that thermal runaway has started to take place. Do an extra twenty strokes, just for luck, before you stop. Carefully remove the spindle from the drilling hole while holding the fire board absolutely still. Continue to hold the fire board using your left hand and then even more carefully remove your left foot without disturbing the hot smoking black drilling powder, as per photo (c). Don't be in a hurry, take your time.



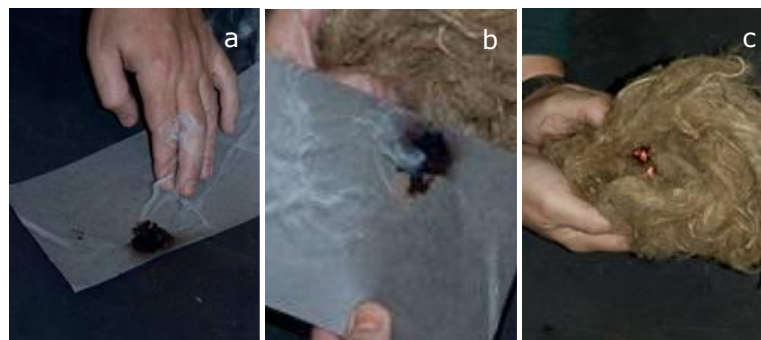
Tip: Ask a friend to help, especially the first time. Let the person put their right foot onto the fire board, and hold the bearing and spindle with both hands, supported by their leg, as shown in photo (a). You then put your left hand onto their right foot, as shown in photo (b), to help with your balance, and then with your right hand operate the bow. Your friend then pushes down the tot-glass bearing, and keeps the spindle upright. You'd be surprised how teamwork helps, especially if your friend cheers you on to success.

Step 10: Now we need to nurse the hot black smoking drilling powder into a red hot ember. Keep holding the fire board absolutely still with your left hand. Then, start moving the air by gently waving with your right hand above the smoking black drilling powder. Increase the oxygen flow, by gently blowing air with your mouth and lips over the smoking black drilling powder until a small red ember becomes visible, as per photo (b). Don't blow too hard, or you will blow away the drilling powder, and you will have to start all over. Please, be patient, don't rush, you are nearly there. Once you have an established red hot ember, you remove the fire board by gently pushing your knife point down the one side on the "v" notch onto and holding down the drill powder and ember catcher while

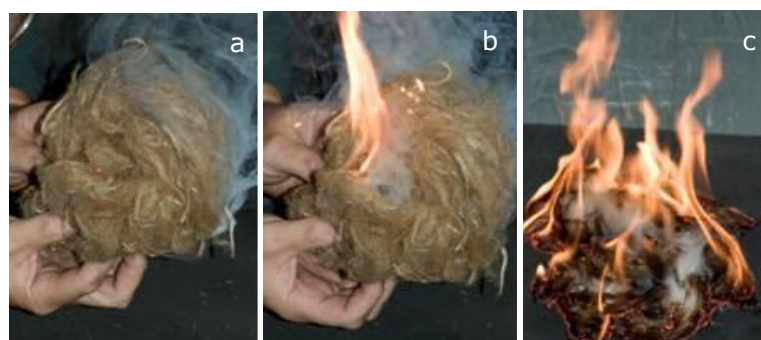
carefully lifting back the fire board, as per photo (c). Ok, now you have a smouldering red hot ember.



Step 11: We now need to carefully transfer this glowing ember and hot smoking drill powder, as shown in photo (a) into the tinder nest. Carefully take the drill powder and ember catcher in your right hand, without disturbing the ember and drilling powder heap, and take the tinder nest in your left hand, now gently transfer the glowing ember and hot smoking drill powder into the middle of the tinder nest. Put down the drill powder and ember catcher, and take the tinder nest with glowing ember in both hands, as per photo (c).



Step 12: Ok, the grand finale, now let's start the fire. Fold the tinder nest over the glowing ember, as per photo (a). Gently start blowing air into the nest, in the area the ember is situated. The tinder nest will start smoking, blow harder, and harder, don't stop until the tinder nest suddenly bursts into flames, as per photo (b). Yes, you've done it, flames as per photo (c) to start a big fire with. All you have to do now is to put this burning tinder nest into your pre-prepared fire pile, and that's it a fire started with a fire bow.



Well, you have the tricks to do the deed, now go for it, and if you don't get it working blame the person you see in the mirror when you brush your teeth in the morning, good luck and enjoy the moment of success ...

Note: For those "comfortable gentleman" ... you can purchase a complete fire bow set, exactly as used in the article above and ready for action from Gavin "Slow Match" Margrate at e-mail address plumcrazy@absamail.co.za or phone him on +27 (0)82 469 3236.

Thanks to Dr Riana Geschke for the photos taken and also my sidekick Wessel Croukamp who assisted with the fire making.

Dr Wallace Vosloo